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UNITED STATES DISTRICT COURT
CENTRAL DISTRICT OF CALIFORNIA

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

DISH NETWORK CORPORATION, *et al.*,

Defendants.

Case No.: 2:23-cv-01043-JWH-KES
(Lead Case)

Case No. 2:23-cv-05253-JWH-KES
(Member Case)

**FIRST AMENDED COMPLAINT
FOR PATENT INFRINGEMENT**

ENTROPIC COMMUNICATIONS, LLC,

Plaintiff,

v.

DIRECTV, LLC, *et al.*,

Defendants.

1 Plaintiff, Entropic Communications, LLC (“Entropic”), files this complaint for
2 patent infringement against DIRECTV, LLC (“the DIRECTV defendants”) and
3 AT&T Services, Inc. (the defendants are collectively referred to as “DIRECTV”),
4 and in support thereof alleges as follows:

5 1. Around the turn of the millennium, cable and satellite providers were
6 eager to deploy new and improved services, but they faced a big problem. The
7 providers needed a high-speed data network inside buildings to deliver those services
8 to various rooms. With existing technology, this meant installing new cabling inside
9 each premises to carry the network. Aside from the costly materials themselves,
10 technicians would be forced to spend hours planning the work, cutting and drilling
11 into walls, and fishing cables throughout a building, all while doing so in ways
12 customers might tolerate. The costs would run into the billions of dollars.

13 2. A group of inventors had a vision: what if they could repurpose the
14 already-existing coaxial cables common in buildings to do the job? The challenges
15 were daunting. Existing coaxial cabling was never intended to work this way. The
16 mess of existing coax topologies in homes and businesses was a formidable barrier.
17 The splitter devices used to distribute legacy TV obstructed signals from room-to-
18 room. Making it all work would require nothing less than the invention of a new
19 networking architecture founded upon a host of new technologies.

20 3. They succeeded. The inventors’ company, called Entropic
21 Communications Inc. (“Entropic Inc.”), made the technology work. The company
22 was awarded a portfolio of patents for the advances that made it possible. And the
23 company spearheaded forming a new industry standard for the architecture,
24 commonly called Multimedia over Coax Alliance standards (the “MoCA” standards).

25 4. Today, MoCA is the backbone of data and entertainment services for
26 tens of millions of customers. MoCA is widely used by every major provider in the
27 industry, saving them billions of dollars in costs and avoiding the hassle of re-wiring
28 for providers and customers alike. Unfortunately, the defendants take advantage of

1 MoCA without paying appropriate licensing fees for the technology. This lawsuit is
2 about redressing that wrong.

3 5. This is a civil action arising under the patent laws of the United States,
4 35 U.S.C. § 1 *et seq.*, including specifically 35 U.S.C. § 271, based on the defendants'
5 infringement of U.S. Patent Nos. 7,295,518 (the "'518 Patent"), 7,594,249 (the "'249
6 Patent") U.S. Patent Nos. 7,889,759 (the "'759 Patent"), 8,085,802 (the "'802
7 Patent") U.S. Patent Nos. 9,838,213 (the "'213 Patent"), 10,432,422 (the "'422
8 Patent") U.S. Patent Nos. 8,631,450 (the "'450 Patent"), 8,621,539 (the "'539
9 Patent") U.S. Patent No. 8,320,566 (the "'0,566 Patent"); U.S. Patent No. 10,257,566
10 (the "'7,566 Patent"); U.S. Patent No. 8,228,910 (the "'910 Patent"); U.S. Patent No.
11 8,363,681 (the "'681 Patent") (collectively all of the patents are referred to herein as
12 the "Patents-in-Suit" or "Asserted Patents"). These patents incorporate various
13 elements of technology set forth in the MoCA standards.

14 **THE PARTIES**

15 6. Entropic is a Delaware limited liability company with an office at 7150
16 Preston Road, Suite 300, Plano, Texas 75024.

17 7. Entropic is the owner by assignment to all right, title, and interest to the
18 Patents-in-Suit. Entropic is the successor-in-interest for the Patents-in-Suit.

19 8. The DIRECTV defendants have as their registered agent in California,
20 CT Corporation System, 330 N. Brand Blvd., Suite 700, Glendale, California 91023.

21 9. AT&T Services, Inc. is a Delaware corporation with a place of business
22 at 208 South Akard Street, Dallas, Texas 75202.

23 10. As further alleged herein, this Court has personal jurisdiction over
24 DIRECTV, and venue is proper in this Judicial District.

25 **HISTORY OF TELEVISION NETWORKING TECHNOLOGY AND** 26 **THE STATE OF THE ART AS OF THE EARLY 2000s**

27 11. Cable television in the United States traces its origins back to the late
28 1940s. At that time, the existing method for delivering TV signals was over-the-air

1 broadcast in which content was transmitted as radio waves from a TV station to TV
2 antennas. However, homes in mountain valleys, such as in Eastern Pennsylvania, had
3 poor reception of broadcast TV signals. To solve this problem, mountaintop antennas
4 were used to receive the signals, and then cabling was installed to connect the homes
5 to those mountaintop antennas. This method proved to be effective and reliable, and
6 cable television took off in popularity in the decades that followed, expanding far
7 beyond its original application and leaving the mountain valleys to become a
8 ubiquitous feature of TV distribution nationwide.

9 12. At its core, a cable system centers around a “head-end,” a facility for
10 distributing television signals to subscribers’ homes. These signals would be carried
11 over coaxial cable or, more recently, a combination of fiber optic and coaxial cables,
12 which allow for transmission over long distances with little signal loss or
13 interference. Coaxial cables owned by the cable provider run to a point of entry at
14 the user’s premises, where the cable provider’s coaxial network connects to the on-
15 premises coaxial network; the signal from the cable provider are distributed
16 throughout the premises via the on-premises coaxial network.

17 13. In the 1970s, satellite television was developed. A conventional setup
18 for satellite service was “direct-to-home” distribution. With direct-to-home service,
19 television signals are transmitted from an uplink facility to satellites, which transmit
20 the signals to an outdoor unit installed on a home or multi-dwelling unit. The outdoor
21 unit has a receiver and an antenna that focuses the satellite signals onto the receiver.
22 The outdoor receiver in turn distributes the satellite signals to devices on the premises
23 through, for instance, installed conventional coaxial cabling.

24 14. As of the early 2000s, coaxial cabling was connected to over 300 million
25 television sets in the United States. At that time, coaxial cabling connections were
26 the preferred in-on-premises video distribution medium for over 90 million cable and
27 satellite homes in the United States.

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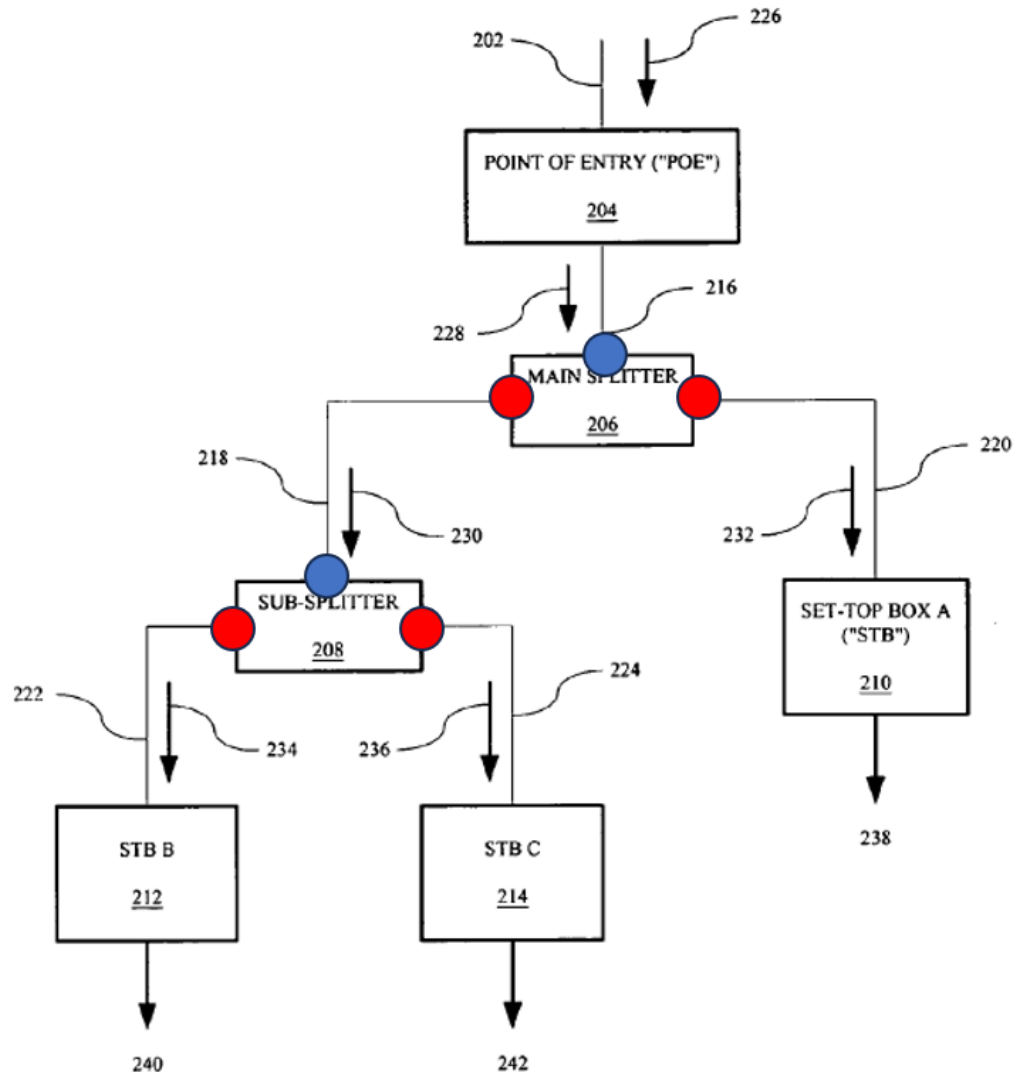
1 15. As of the early 2000s, and in the decades prior, many homes in the
2 United States had multiple devices that received cable or satellite service over coaxial
3 cabling.

4 16. In a home or building with multiple devices connected to coaxial
5 cabling, it was standard to use splitters to distribute the signal received from outside
6 the premises to the multiple on-premises devices, such as multiple TVs or digital
7 video recorders, and to connect those devices back to the source.

8 17. Conventional splitters typically have a single input, also known as a
9 common port. The splitter splits the input signal into multiple outputs, also known as
10 tap ports. Coaxial cable extending from these ports could connect to devices in the
11 home and/or to yet another splitter (or splitters) before the signal finally reached the
12 devices.

13 18. As used herein, the terms “conventional coaxial network” or
14 “conventional on-premises coaxial network” refers to the legacy coaxial cable
15 installation that was used as of the early 2000s to distribute programming, such as
16 television content, to consumer devices on premises, such as a home, office, or
17 apartment building.

18 19. An exemplary architecture of a conventional coaxial network in the
19 early 2000s is depicted below in an annotated version of Fig. 2 of the '450 Patent.
20 Here, programming from a provider's network enters the premises at the point of
21 entry. From the point of entry, coaxial cabling is used to connect each device to the
22 provider's network. These connections are made using a series of splitters to connect
23 each device with the source of programming. In the exemplary architecture below,
24 there are three devices connected to the provider's network (Set-Top Boxes A, B,
25 and C) through coaxial cabling and multiple splitters. For the connections on the
26 splitters, input ports are marked in blue, with output ports marked in red:



20. An architecture network similar to that shown in Paragraph 18 could also be used with satellite systems, with appropriate technical variations. Signals could be received by a point of entry to the premises and then distributed throughout the premises through coaxial cabling and a series of splitters.

21. The conventional coaxial network architecture was configured to support transmission from a source outside of the premises, such as a cable head-end, to devices on the premises, such as a set-top box. Thus, the splitters were configured to optimize transmission from the source to an endpoint.

22. Among other things, in a conventional coaxial network architecture, splitters were designed to isolate the output ports from one another. In other words,

1 the splitters were designed such that a signal being sent from the device towards the
2 source of programming would not “couple” to the other output ports of the splitter.
3 Rather, the splitters were designed to attenuate the passage of any signals between
4 output ports. This was done to reduce interference in the communication channel
5 between the source of programming and an individual device.

6 23. Although this configuration helped facilitate communication from a
7 programming source to a user’s device, it impeded communication between devices.
8 The conventional wisdom in the field as of the early 2000s, and for many years prior,
9 was that the structure of conventional coaxial networks, including the isolation of
10 end devices from each other, and the unknown and variable composition of the
11 physical network, prevented devices on the same conventional coaxial network from
12 communicating with one another across the output ports of the splitter.

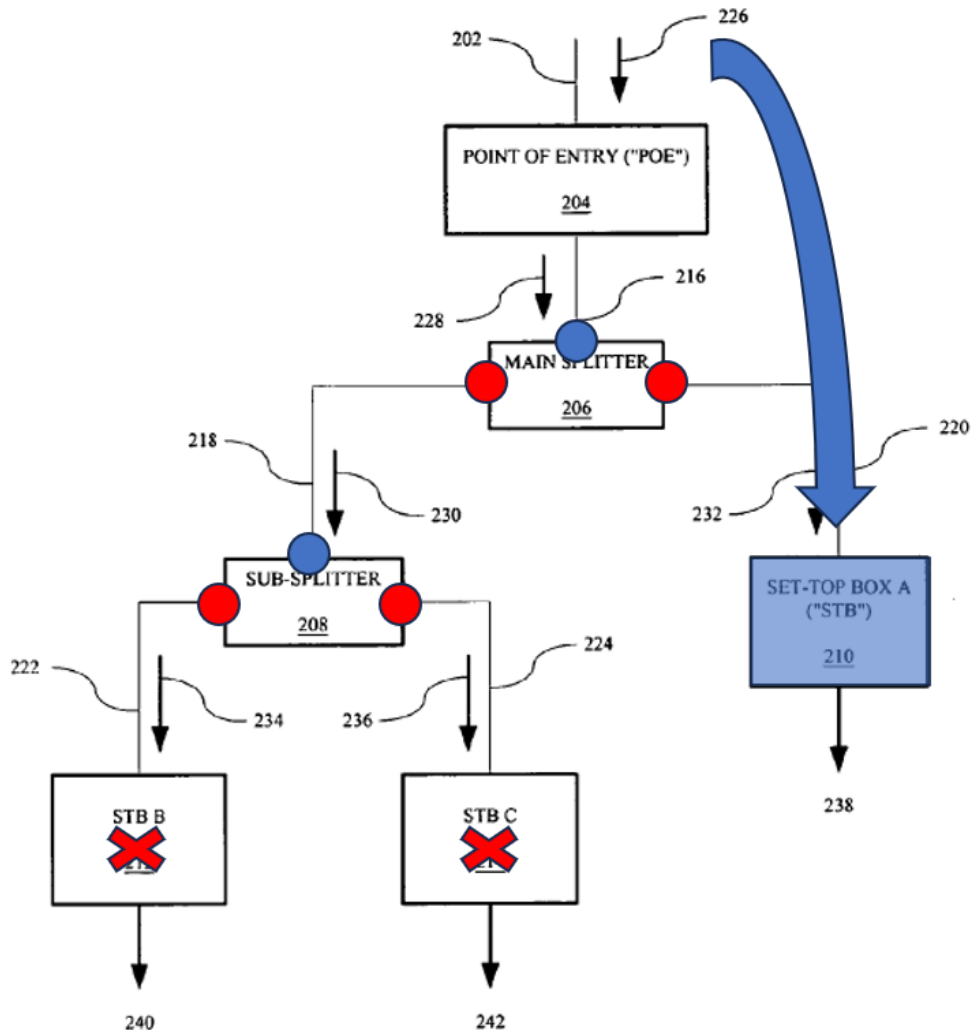
13 24. As a consequence of the isolation of the output ports and the attenuation
14 of signals crossing between them, it was not well-known or routine to transmit signals
15 between different devices that were connected to the output ports of a conventional
16 coaxial network.

17 25. In fact, in the conventional coaxial networks of the early 2000s, there
18 was no mechanism, let alone a well-known one, for devices in a home or other
19 premises to communicate with one another at all. Thus, while each consumer device
20 in a home or premises could receive programming from a source outside of the home
21 or premises, there existed no well-known path or method for them to communicate
22 with one another.

23 26. Just as there was no well-known mechanism for end devices in the home
24 to communicate with each other over conventional coaxial networks in the early
25 2000s, there was also no well-known mechanism for those devices to locate one
26 another or become aware of each other’s existence. For instance, there was no
27 “discovery” or “admission” process that allowed devices within the home to admit a
28 new device to such an environment. Thus, while each consumer device in a home or

building could establish a connection with a source of programming from outside the building, there existed no well-known method for those devices to do so with respect to one another.

27. An illustration of the capabilities of a conventional coaxial network as of the early 2000s is depicted below using the exemplary architecture shown in Paragraph 18. As shown below, a device connected to the conventional coaxial networks of the early 2000s (as an example, Set-Top Box A marked in blue) could communicate with the source of programming (also marked in blue). But that device would not communicate through the conventional coaxial network with any other device, such as Set-Top Boxes B or C, as indicated by the red X's:



1 28. On-premises networks used for satellite TV were similarly limited. A
2 device connected to a satellite receiver via on-premises coaxial cabling could receive
3 programming from a source, but would not communicate through a conventional
4 coaxial network with other devices connected to that network.

5 29. Further, as noted above, the communication paths between different
6 devices on a coaxial network have different characteristics. This could be due to, for
7 instance, the number of splitters along the communication path, the attenuation
8 characteristics of the splitter(s), the length or quality of the coaxial cable along the
9 path, and so on.

10 30. Further still, the characteristics of the paths can differ between the
11 upstream and downstream paths between the same two devices. This is because the
12 channel paths are not necessarily symmetrical and instead may have different
13 properties depending on the direction of signals sent between the devices. For
14 instance, the types of splitters used in conventional coaxial installations altered the
15 properties of signals being sent towards the end devices in a very different way than
16 they did for signals being sent away from them.

17 31. For instance, in the illustration shown in Paragraph 27, the
18 communication path from Set-Top Box A to Set-Top Box B (which has two splitters
19 between them) could have different properties than the communication path from the
20 Set-Top Box B to Set-Top Box C (which passes through only one splitter). So, too,
21 could the characteristics of the path from Set-Top Box A to Set-Top Box B differ
22 from the characteristics of the path from Set-Top Box B back to Set-Top Box A.

23 32. These differences in channel characteristics posed yet another
24 technological barrier to communication between devices in a home over a coaxial
25 network. In particular, these characteristics made it difficult to determine the
26 appropriate modulation scheme or other parameters that would allow two or more
27 devices connected to a conventional coaxial network to communicate with one
28 another.

1 33. Around this same time in the early 2000s, digital video recording
2 (“DVR”) technology was introduced. This technology allowed devices to record
3 television programming for later playback.

4 34. The introduction of DVR technology created demand for the ability to
5 record content on one device and transmit it to another device in the same home.

6 35. As of the early 2000s, companies like Microsoft and Hewlett-Packard
7 sold dedicated equipment that could stream content from an “Entertainment Center”
8 to a “Media Extender” Within a home or building. But these options were cost-
9 prohibitive for the vast majority of consumers. They also required a networking
10 infrastructure that very few consumers had in their homes at the time, such as
11 Ethernet cabling throughout the home or a high-speed wireless network that could
12 handle video streaming.

13 36. In contrast, on-premises coaxial cabling had the benefit of being pre-
14 installed in tens of millions of homes, but it did not support the transmission of
15 content from one device to another.

16 37. The technological limitations of coaxial networks were understood as of
17 the early 2000s to pose substantial barriers to meeting the demand for transmitting
18 content between devices in a home. For instance, the limitations of coaxial networks
19 in the early 2000s meant that video recorded on one device could not be streamed to
20 another device in the same home even though both devices were connected to the
21 same conventional coaxial network.

22 38. In sum, the conventional coaxial network of the early 2000s was built
23 to facilitate “vertical” communication between the source of programming and a
24 particular consumer device. But as a consequence, it was not configured for, and in
25 many ways impeded or prevented, “horizontal” communication between devices
26 connected to the conventional coaxial network in a consumer’s home.

27 ///

28 ///

**ENTROPIC INC. IS FOUNDED TO OVERCOME THE LIMITATIONS OF
CONVENTIONAL COAXIAL NETWORKS**

39. Entropic Inc., the predecessor-in-interest to Entropic as to the Patents-in-Suit, was founded in San Diego, California in 2001 by Dr. Anton Monk, Itzhak Gurantz, Ladd El Wardani, and others.

40. Entropic Inc. set out to solve the problems with conventional coaxial networks described in Paragraphs 11 through 38 above.

41. Entropic Inc. tackled the problem and managed what was considered technologically forbiddingly difficult, if not impossible: high-speed point-to-point digital communication using existing coaxial installations. This required substantial inventive effort that is embodied by the claimed inventions of the Patents-in-Suit.

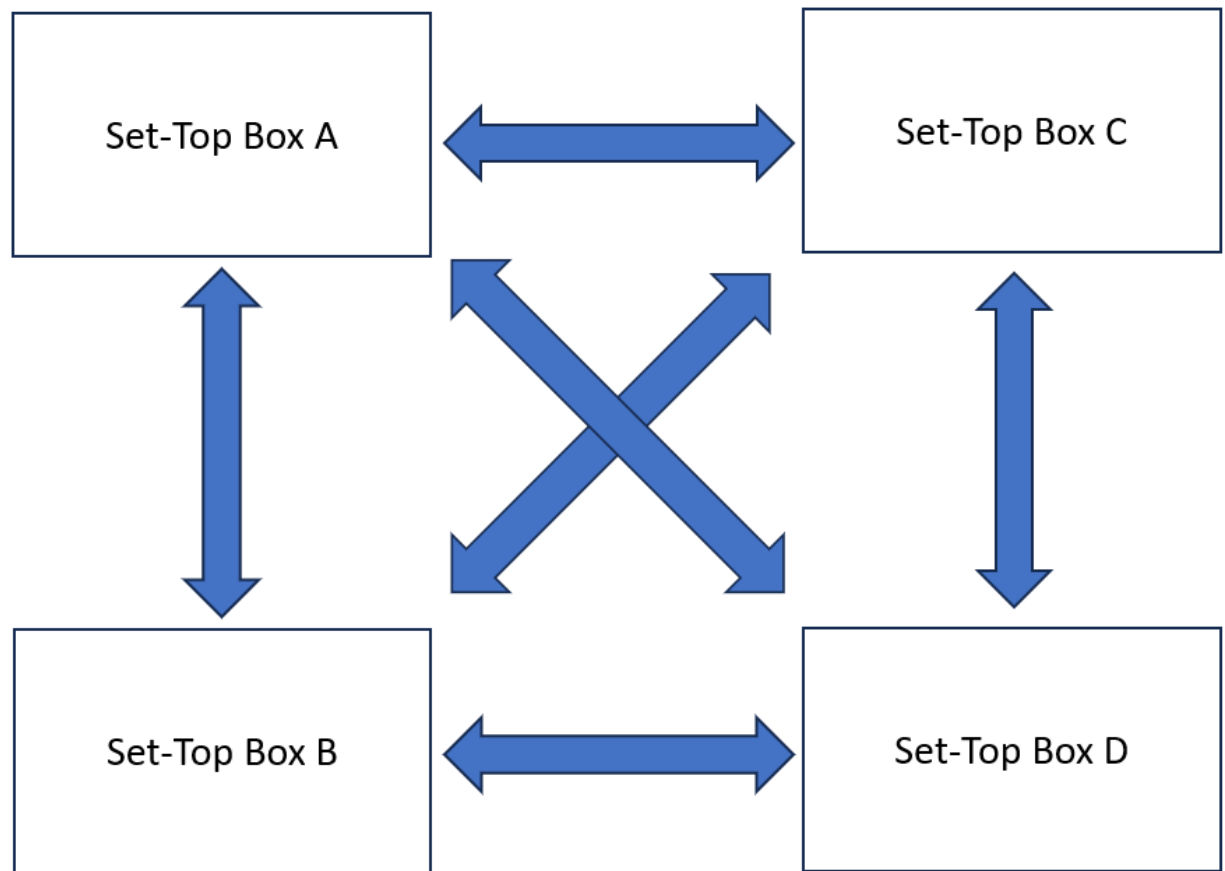
42. Entropic Inc.'s innovations, as embodied in the claimed inventions of the Patents-in-Suit, transformed coaxial networking technology by allowing for an on-premises network to be established over existing on-premises coaxial cabling.

43. Among other applications, Entropic Inc.'s new technology allowed devices in the home to transmit content to one another over the existing coaxial cables.

44. Entropic Inc.'s innovations, as embodied in the claimed inventions of the Patents-in-Suit, allowed a new type of logical network to exist on a physical structure—the conventional coaxial network—that was not designed to allow such a logical network to exist.

45. Prior to Entropic Inc.'s innovations, the logical architecture of conventional coaxial networks was limited to a “top-down” model. This meant that a source of programming could transmit content to each of the individual devices connected to a conventional coaxial network, but the individual devices could not transmit content to one another. This limitation was a consequence of the technological limitations of the components of the coaxial network at the time, such as the characteristics of the splitters used.

46. With Entropic Inc.’s innovations, as embodied in the claimed inventions of the Patents-in-Suit, an entirely new networking model became possible for communication over existing on-premises coaxial cabling. Now the conventional coaxial network could operate in a point-to-point or “mesh” fashion, creating new communication paths that did not exist before. The logical communication model thus enabled is illustrated below, using an example of a network that has four set-top boxes connected to a coaxial network (note that the arrows below represent logical connections between devices, rather than physical links; the underlying coaxial cable topology remains unchanged from the conventional installations discussed above):



47. As explained in more detail below, each of the claimed inventions of the Patents-in-Suit contributed to this transformation in coaxial networking technology.

48. Over the years that followed, Entropic Inc. pioneered innovative networking technologies, as well as television and internet related technologies. These technologies simplified or eliminated the need for installation of new

1 equipment to support wideband reception of multiple channels for demodulation,
2 improve internet performance, and enabled more efficient and responsive remote
3 troubleshooting and signal management for cable providers. These innovations
4 represented significant advances in the field, simplified the implementation of those
5 advances, and reduced expenses for providers and customers alike.

6 49. Entropic Inc. received multiple awards, recognition, and praise for its
7 early innovative work that transformed the types of communication that were
8 possible over coaxial cable networks. These awards and recognition include:

- 9 • In 2003, the “Breakthrough Innovation in Communications” Award
10 from the T Sector San Diego;
- 11 • In 2004, the “Most Innovative New Product” Award for
12 Telecommunications (17th Annual CONNECT Awards);
- 13 • In 2004, the first annual “Innovator in Telecommunications” Award
14 from the San Diego Telecom Council;
- 15 • In 2004, a finalist for the “Startup of the Year” Award from EDN
16 Magazine;
- 17 • In 2005, a finalist for the “Innovation of the Year” Award from EDN
18 Magazine.

19 **MOCA® AND THE MOCA® STANDARDS**

20 50. At the same time Entropic Inc. was inventing a new networking
21 architecture for coaxial networks, it also founded an organization to standardize the
22 new networking architecture it had invented and to promote its use. This became
23 known as the Multimedia over Coax Alliance, or “MoCA.”

24 51. MoCA is an alliance of companies that operate in the field of technology
25 associated with providing multimedia services, such as television operators,
26 consumer electronics manufacturers, semiconductor vendors, and original equipment
27 manufacturers (OEMs). MoCA has developed and published a standard governing
28 the operation of devices using existing coaxial cable.

1 52. The MoCA acronym has also come into common usage as the name
2 given to the networking architecture that Entropic Inc. had invented, now embodied
3 in technical standards documents promulgated by MoCA.

4 53. The technology defined in the MoCA standards enables point-to-point
5 high-quality network communication that met a long-felt need in the cable and
6 satellite television industries. Crucially, it also provides the operators the ability to
7 deploy cutting-edge services that require transmitting content between end devices
8 without the enormously costly effort of installing Ethernet or similar cabling to carry
9 the data.

10 54. Entropic Inc. was exclusively responsible for the development of the
11 initial version of the MoCA standards, including MoCA 1.0, ratified in 2006.

12 55. The MoCA standards ensure network robustness along with inherent
13 low packet error rate performance and very low latency that is relatively independent
14 of network load. The logical network model of the MoCA network is significantly
15 different from the underlying on-premises legacy coaxial network. For example, due
16 to the effects of splitter jumping and reflections, the channel characteristics for a link
17 between two MoCA nodes may be dramatically different from a link between any
18 other two MoCA nodes.

19 56. The technological developments embodied in the MoCA standard
20 enable users to avoid the significant costs associated with rewiring their home or
21 business in order to allow high speed point-to-point to communication between
22 devices throughout the premises. Further, these technological developments allow
23 services requiring reliable, high-speed data and video communications between
24 devices on a home network to be provided to the user while utilizing the on-premises
25 coaxial cabling already present in the user's home or business.

26 57. Entropic Inc. spearheaded MoCA, and its founders are the inventors of
27 several patents—including each of the Patents-in-Suit—that cover various
28 mandatory aspects of the MoCA standards.

1 58. By conforming to the MoCA standards, a product necessarily practices
2 those patents, either by itself, as a part of a MoCA-compliant system, or in the method
3 in which it operates.

4 **ENTROPIC INC.'S EARLY INVENTIONS ARE DIRECTED TO SOLVING**
5 **TECHNOLOGICAL PROBLEMS IN COAXIAL NETWORKS**

6 59. Several of the Patents-in-Suit claim priority to dates between 2001 to
7 2004. These include the '518 Patent, the '249 Patent, the '759 Patent, the '802 Patent,
8 the '539 Patent, and the '450 Patent.

9 60. Each of these Patents-in-Suit, as described below, claims a
10 technological solution to a problem arising in the context of enabling packet-based,
11 point-to-point networking over installed coaxial cable infrastructure in homes or
12 buildings, as of the early 2000s.

13 61. The technology claimed in each of these Patents-in-Suit solves specific
14 technological problems inherent in transforming the topology of existing coaxial
15 networks to enable point-to-point communication between devices in a customer's
16 home.

17 62. Each of these Patents-in-Suit claims activities that whether viewed alone
18 or in combination were not routine or conventional in existing on-premises coaxial
19 networks as of the date the patents were filed.

20 63. **The '518 Patent.** Claim 1 of the '518 Patent recites a data
21 communication network comprising:

22 at least two network devices, each network device comprising a multi-
23 carrier modulator for modulating data, an up converter for
24 translating the modulated data to an RF carrier frequency, a down
25 converter for translating an RF signal, and a multi-carrier
26 demodulator for demodulating the translated RF signal to produce
27 data; and

28 ///

1 cable wiring comprising a splitter with a common port and a plurality
2 of tap ports, and a plurality of segments of coaxial cable connecting
3 between the splitter tap ports and the network devices;
4 whereby network devices communicate with each other through the
5 cable wiring using multi-carrier signaling;
6 wherein network devices transmit probe messages through the cable
7 wiring and analyze received probe message signals to determine
8 channel characteristics and bit loading is selected based on the
9 determined channel characteristics.

10 64. Claim 1 of the '518 Patent is directed to enabling communication
11 between devices that are connected to the tap (output) ports of a coaxial splitter. This
12 type of communication has since been referred to as "splitter jumping" or "jumping
13 the splitter."

14 65. Claim 1 of the '518 Patent recites a solution to the technological hurdles
15 associated with "splitter jumping."

16 66. Claim 1 of the '518 Patent recites the use of probe messages to
17 determine channel characteristics and bit loading for communication between
18 network devices connected to a splitter. These recited activities improve the
19 functionality of coaxial networking technology. In particular, these recited activities
20 overcome the problems with conventional coaxial networks, where communication
21 paths between devices were impeded by the isolation between splitter ports and the
22 high variance in channel characteristics between those devices.

23 67. Prior to the invention of the '518 Patent, communication between
24 devices that are connected to the output ports of a coaxial splitter (splitter jumping)
25 faced numerous technological hurdles, and was not routine, conventional, or well-
26 known, as explained in Paragraphs 11 to 38 above.

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28 ///

1 68. Prior to the invention of the '518 Patent, splitter jumping in a coaxial
2 network for the purpose of high bandwidth communications between devices in a
3 home, such as streaming of video, was not routine, conventional, or well-known.

4 69. Prior to the invention of the '518 Patent, it was not a routine,
5 conventional, or well-known activity to determine the characteristics of the
6 communication channels between devices in a home coaxial network.

7 70. The invention of the '518 Patent enabled a new type of communication
8 over coaxial networks that was not routine, conventional, or well-known. It achieved
9 this innovation by improving the technology that had been installed in millions of
10 homes across this United States for years, but which no one had previously been able
11 to improve in the same way.

12 71. The element of “cable wiring comprising a splitter with a common port
13 and a plurality of tap ports, and a plurality of segments of coaxial cable connecting
14 between the splitter tap ports and the network devices” recites a particular
15 technological environment, namely a coaxial network within a home with devices
16 connected by a splitter.

17 72. As described in Paragraphs 11 to 38 above, the conventional coaxial
18 network had unique technological limitations as of the priority date of the '518 Patent
19 that made horizontal communication between devices (splitter jumping) difficult and
20 impractical. In particular, the isolation between output ports and attenuation of the
21 signals crossing between them posed a technological barrier to this type of
22 communication.

23 73. Claim 1 of the '518 Patent recites multiple elements that were not
24 routine or conventional activity in the particular technological environment of
25 existing on-premises coaxial networks as of the priority date of the '518 Patent.

26 74. The element of “whereby network devices communicate with each other
27 through the cable wiring using multi-carrier signaling” recites a technological
28 capability that was not routine or conventional as of the priority date of the '518

1 Patent. As of that date, communication between network devices connected to the
2 tap ports of a splitter in a coaxial network (splitter jumping) was not a routine or well-
3 known activity for the reasons explained in Paragraphs 11 to 38 above.

4 75. The element of “wherein network devices transmit probe messages
5 through the cable wiring and analyze received probe message signals to determine
6 channel characteristics and bit loading is selected based on the determined channel
7 characteristics” recites a technological capability that was not routine or conventional
8 as of the priority date of the ’518 Patent for the reasons explained in Paragraphs 11
9 to 38 above.

10 76. As of the priority date of the ’518 Patent, network devices connected to
11 the tap ports of a splitter in a conventional coaxial network did not send or receive
12 signals to one another. Sending signals of any kind between such devices was not a
13 routine or well-known activity in this type of network for the reasons explained in
14 Paragraphs 11 to 38 above.

15 77. As of the priority date of the ’518 Patent, network devices connected to
16 the tap ports of a splitter did not send or receive probe messages to one another.
17 Sending probe messages between devices connected to the tap ports of a splitter in a
18 conventional coaxial network was not a routine or well-known activity as of that date
19 for the reasons explained in Paragraphs 11 to 38 above.

20 78. As of the priority date of the ’518 Patent, network devices connected to
21 the tap ports of a splitter in a conventional coaxial network did not determine the
22 characteristics of the communication channel between them. Characterizing the
23 communication channel between two devices in such a network was not a routine or
24 well-known activity as of that date for the reasons explained in Paragraphs 11 to 38
25 above.

26 79. As of the priority date of the ’518 Patent, it was not routine or
27 conventional to combine (1) communicating between devices connected to the tap
28 ports of a splitter in a coaxial network; (2) sending and receiving probe messages

1 between those devices using the coaxial network; and (3) determining the
2 characteristics of the channel between them.

3 80. **The '249 Patent.** Claim 10 of the '249 Patent recites a broadband local
4 area network for transmitting modulated signals using coaxial cable building wiring
5 containing a plurality of branches comprising:

6 a filter located at the point of entry of the building wiring that rejects
7 network signals originating in the building wiring such that the rejected
8 network signals do not pass through the filter, but rather are reflected
9 by the filter back into all branches of the building wiring;

10 at least one signal splitter;

11 a plurality of terminal devices connected to the wiring branches, each
12 terminal device capable of communicating with other terminal devices
13 the reflected signal path created by the filter, wherein the terminal
14 devices perform equalization on the received signal that restores a flat
15 frequency response to overcome communication channel impairments
16 caused by the reflected signals.

17 81. Claim 10 of the '249 Patent is directed to enabling communication
18 between devices that are connected to a broadband local area network using coaxial
19 cabling.

20 82. Claim 10 of the '249 Patent recites a solution to the technological
21 hurdles associated with “splitter jumping.” Claim 10 of the '249 Patent recites the
22 use of a filter at the point of entry to a building as part of a coaxial network that
23 includes a splitter. Claim 10 of the '249 Patent further recites communication
24 between devices within the building using a reflected signal path created by the filter
25 and using equalization to overcome communication channel impairments caused by
26 the reflected signals.

27 83. These recited activities improve the functionality of conventional
28 coaxial networking technology. In particular, these recited activities overcome the

1 problems with conventional coaxial networks, where communication paths between
2 devices were impeded by the isolation between splitter ports and the high variance in
3 channel characteristics between those devices.

4 84. Prior to the invention of the '249 Patent, it was not routine,
5 conventional, or well-known in conventional coaxial networks to use a filter that
6 rejects signals and reflects them, building back into the branches of the building
7 wiring.

8 85. Prior to the invention of the '249 Patent, communication between
9 devices using a reflected signal path in a conventional coaxial network was not
10 routine, conventional, or well-known.

11 86. Prior to the invention of the '249 Patent, communication between
12 devices in a conventional coaxial network that includes a signal splitter was not
13 routine, conventional, or well-known.

14 87. Prior to the invention of the '249 Patent, performing equalization on a
15 received signal to overcome channel impairments caused by reflected signals in a
16 conventional coaxial network was not routine, conventional, or well-known.

17 88. The element of “a plurality of terminal devices connected to the wiring
18 branches, each terminal device capable of communicating with other terminal
19 devices the reflected signal path created by the filter” recites a technological
20 capability that was not routine or conventional as of the priority date of the '249
21 Patent for the reasons explained in Paragraphs 11 to 38 above.

22 89. As of the priority date of the '249 Patent, it was not routine or
23 conventional to combine (1) a filter located at the point of entry of a building to reflect
24 signals back through all branches of coaxial wiring; (2) a signal splitter; (3) a plurality
25 of terminal devices connected to the wiring branches that are capable of
26 communicating with other terminal devices through the reflected signal path created
27 by the filter; and (4) terminal devices performing equalization on the received signal
28 to overcome communication channel impairments caused by the reflected signal.

1 90. **The '759 Patent.** Claim 1 recites a method for determining a common
2 bit-loading modulation scheme for communicating between a plurality of nodes in a
3 broadband cable network ("BCN"), the method comprising:

4 transmitting a probe signal from a transmitting node within the plurality
5 of nodes to a sub-plurality of receiving nodes within the plurality of
6 nodes;

7 receiving a plurality of response signals from the sub-plurality of
8 receiving nodes wherein each response signal includes a bit-loading
9 modulation scheme determined by a corresponding receiving node; and
10 determining the common bit-loading modulation scheme from the
11 received plurality of response signals;

12 receiving the probe signal at one receiving node of the plurality of
13 receiving nodes through a channel path of transmission;

14 determining the transmission characteristics of the channel path at the
15 one receiving node; and

16 transmitting a response signal from the one receiving node to the
17 transmitting node,

18 wherein the transmission characteristics of the channel path are
19 determined by measuring the signal-to-noise ("SNR") characteristics of
20 the received probe signal at the one receiving node and

21 wherein determining a common bit-loading modulation scheme
22 includes:

23 comparing a plurality of bit-loading modulation schemes from
24 the corresponding received plurality of response signals; and
25 determining the common bit-loading modulation scheme in
26 response to comparing the plurality of bit-loaded modulation
27 schemes.

28 ///

1 91. Claim 1 is directed to solving a technological problem in the field of
2 broadband cable networks. In particular, conventional broadband cable networks at
3 the time were used for transmission of programming in a “top-down” fashion to
4 devices in a home or other building. These conventional broadband cable networks
5 did not facilitate transmission of data from one device to another device on the
6 network, let alone from one device to multiple devices simultaneously on the
7 network.

8 92. Claim 1 is directed to a point-to-point topology, where each device in a
9 network communicates with the other devices in that network in a direct and non-
10 hierarchical fashion. As of the priority date of the ’759 Patent, this network topology
11 was not routine, conventional, or well-known in the field of conventional coaxial or
12 broadband cable networks for the reasons explained in Paragraphs 11 to 38 above.

13 93. Claim 1 improves the technology of broadband cable networking by
14 enabling devices to communicate using broadcast transmissions that are customized
15 for the characteristics of the communication paths in that network.

16 94. At the time of the invention of the ’759 Patent, it was not routine,
17 conventional, or well-known in the art for devices connected to a conventional
18 broadband cable network in the home or other premises to operate as nodes that could
19 send data to, and receive data from, other nodes on that network.

20 95. At the time of the invention of the ’759 Patent, it was not routine,
21 conventional, or well-known in the art for a device connected to a conventional
22 broadband cable network to send probes to, or receive probes from another device on
23 that network.

24 96. At the time of the invention of the ’759 Patent, it was not routine,
25 conventional, or well-known in the art for devices connected to a broadband cable
26 network to determine characteristics of the channel path between them.

27 97. At the time of the invention of the ’759 Patent, it was not routine,
28 conventional, or well-known in the art for devices connected to a broadband cable

1 network to communicate with another simultaneously through the use of broadcast
2 transmissions.

3 98. At the time of the invention of the '759 Patent, it was not known in the
4 art that when transmitting data over a broadband cable network from one node to
5 multiple nodes it is generally more efficient to broadcast data over a common bit-
6 loading scheme than to transmit data to each receiving node using a bit-loading
7 scheme specific to each individual communication path.

8 99. **The '802 Patent.** Claim 3 of the '802 Patent recites a method for
9 transmitting packets from a Broadband Cable Network ("BCN") modem to a
10 plurality of nodes in a broadband cable network, the method comprising:

11 formatting the packets in a MAC subsystem that transmits the packets within
12 the broadband cable network, including formatting a data and control
13 packet for transmission within the broadband cable network, the data and
14 control packet having a header and a variable length payload, the header
15 having at least five fields selected from the group consisting of a transmit
16 clock field, packet type field, packet subtype field, version field, source
17 node ID field, destination node ID field, and header check sequence field;
18 receiving the packets from the MAC subsystem at a Modem subsystem that is
19 in signal communication with the MAC subsystem and that appends
20 information to the packets; and
21 upconverting the packets with the information for transmission via the
22 broadband cable network at a RF subsystem that is in signal communication
23 with the Modem subsystem;
24 wherein at least one of the packets is a beacon packet that has a channel number
25 field, change field, sequence number field, network coordinator ID field,
26 next beacon index field, admission frame length field, admission window,
27 asynchronous MAP length field and a beacon Cyclic Redundancy
28 Checking (CRC) field.

1 100. Claim 3 of the '802 Patent improves the technology of broadband cable
2 networking by enabling data connections between a BCN modem and nodes of a
3 broadband cable network directly over the existing coaxial cable with its current
4 architecture, without the need to modify the existing cable infrastructure. The
5 claimed methodology is used in a process that has since been referred to as “node
6 admission,” during which a BCN modem forms initial connections to, and becomes
7 part of, a logical point-to-point network running on a conventional coaxial data
8 network.

9 101. Claim 3 of the '802 Patent recites unique data structures that are
10 specific, and contribute to the improvement in conventional coaxial networking
11 technology that allows a modem on a broadband cable network to communicate with
12 a plurality of other modems on that network.

13 102. In particular, claim 3 of the '802 Patent recites use of a “source node ID
14 field,” “destination node ID field,” and a “network coordinator ID field.” Each of
15 these fields are unique to the node-to-node communication recited in claim 3 of the
16 '802 Patent, and which are used to achieve the technological advance in broadband
17 cable networking that enabled communication between devices on the network.

18 103. Prior to the invention of the '802 Patent, admitting a new node into an
19 conventional coaxial network that allowed high bandwidth communications between
20 devices in a home was not routine, conventional, or well-known.

21 104. Prior to the invention of the '802 Patent, establishing optimal
22 modulation and other transmission parameters that are optimized and periodically
23 adapted to the channel between pairs of devices in a broadband cable network was
24 not routine, conventional, or well-known.

25 105. Prior to the invention of the '802 Patent, the use of a “source node ID
26 field,” “destination node ID field,” and a “network coordinator ID field” was not
27 routine, conventional, or well-known in a broadband cable network. This is because
28 devices in a conventional broadband cable network at the time did not communicate

1 with one another and thus did not identify the source, destination, or network
2 coordinator.

3 106. The invention of the '802 Patent enabled flexibility—by allowing
4 admission of nodes—in this new type of communication over conventional coaxial
5 networks that was not routine, conventional, or well-known. It achieved this
6 innovation without requiring changes to the legacy coaxial cables or splitters that
7 were already installed in millions of homes across the United States.

8 107. The element of “transmitting packets from a Broadband Cable Network
9 (BCN) modem to a plurality of nodes in a broadband cable network” recites a
10 particular technological environment, namely a broadband cable network.

11 108. As described in Paragraphs 11 to 38 above, this broadband cable
12 network environment had unique technological limitations as of the priority date of
13 the '802 Patent that made locating nodes on the network difficult and impractical. In
14 particular, the isolation between output ports and attenuation of the signals crossing
15 between them posed a technological barrier to forming this type of connection
16 between nodes.

17 109. Claim 3 of the '802 Patent recites multiple limitations that were not a
18 routine or conventional activity in the particular technological environment of
19 broadband cable networking as of the priority date of the '802 Patent.

20 110. The element of “formatting the packets in a MAC subsystem that
21 transmits the packets within the broadband cable network, including formatting a
22 data and control packet for transmission within the broadband cable network, the data
23 and control packet having a header and a variable length payload, the header having
24 at least five fields selected from the group consisting of a transmit clock field, packet
25 type field, packet subtype field, version field, source node ID field, destination node
26 ID field, and header check sequence field” recites a technological capability that was
27 not routine or conventional as of the priority date of the '802 Patent. As of that date,
28 the transmitting of packets (including the format of those packets) between network

1 devices connected to the tap ports of a splitter in a coaxial network was not a routine
2 or well-known activity for the reasons explained in Paragraphs 11 to 38 above.

3 111. The element of “upconverting the packets with the information for
4 transmission via the broadband cable network at a RF subsystem that is in signal
5 communication with the Modem subsystem” recites a technological capability that
6 was not routine or conventional as of the priority date of the ’802 Patent. As of that
7 date, upconverting packets so that the transmitted data is carried on RF signals at
8 frequencies higher than the range typically used by cable TV was not a routine or
9 well-known activity because as explained in Paragraphs 11 to 38 above, packet
10 communications between network devices on a home coaxial network was not
11 routine or well-known.

12 112. The element of “wherein at least one of the packets is a beacon packet
13 that has a channel number field, change field, sequence number field, network
14 coordinator ID field, next beacon index field, admission frame length field,
15 admission window, asynchronous MAP length field and a beacon Cyclic
16 Redundancy Checking (CRC) field” recites a technological capability that was not
17 routine or conventional as of the priority date of the ’802 Patent. As of that date,
18 packet communications between network devices connected to the tap ports of a
19 splitter in a coaxial network (splitter jumping)—and therefore the type and the
20 formatting of such communications packets—was not a routine or well-known
21 activity for the reasons explained in Paragraphs 11 to 38 above.

22 113. As of the priority date of the ’802 Patent, network devices connected to
23 the tap ports of a splitter in a coaxial network did not send or receive signals to one
24 another. Sending signals of any kind between such devices was not a routine or well-
25 known activity in this type of network for the reasons explained in Paragraphs 11 to
26 38 above.

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1 114. As of the priority date of the '802 Patent, network devices connected to
2 the tap ports of a splitter did not send or receive beacon messages to one another.
3 Sending beacon messages between devices connected to the tap ports of a splitter in
4 a coaxial network was not a routine or well-known activity as of that date for the
5 reasons explained in Paragraphs 11 to 38 above.

6 115. **The '450 Patent.** Claim 29 of the '450 Patent recites a broadcasting
7 method within a Broadband Coaxial Network ("BCN"), comprising:

8 a transmitting node transmitting a probe signal to a plurality of
9 receiving nodes;

10 the transmitting node receiving a plurality of response signals
11 comprising a plurality of bit-loading modulation schemes from the
12 plurality of receiving nodes, wherein each of the plurality of receiving
13 nodes

14 receives the probe signal through a corresponding channel path,
15 determines transmission characteristics of the corresponding
16 channel path,

17 determines a bit-loading modulation scheme for the
18 corresponding channel path based on the transmission
19 characteristics, and

20 transmits a response signal to the transmitting node informing
21 the transmitting node of the bit-loading modulation scheme for
22 the corresponding channel path;

23 the transmitting node comparing the plurality of bit-loading modulation
24 schemes to determine a common bit-loading modulation scheme; and
25 the transmitting node transmitting a broadcast signal relaying the
26 common bit-loading modulation scheme to the plurality of receiving
27 nodes.

28 ///

1 116. Claim 29 is directed to solving a technological problem in the field of
2 broadband coaxial networks. In particular, conventional broadband coaxial networks
3 at the time did not facilitate transmission of data from one device to another device
4 on the network, let alone from one device to multiple devices simultaneously on the
5 network.

6 117. Claim 29 recites a broadcasting method that is specific, and contributes
7 to the improvement in conventional coaxial networking technology that allows a
8 node on a broadband coaxial network to communicate efficiently with a plurality of
9 other nodes on that network.

10 118. In particular, claim 29 recites determining a “common bit-loading
11 modulation scheme” based on a “plurality of bit-loading modulation schemes”
12 determined by a plurality of receiving nodes on the network in response to probe
13 signals sent by a transmitting node. The sending of probes and determination of a
14 common bit-loading scheme is used to achieve the technological advance in
15 broadband coaxial networking that enabled efficient communication between devices
16 on the network.

17 119. Claim 29 improves the technology of conventional broadband coaxial
18 networks by enabling devices to communicate using broadcast transmissions that are
19 customized for the characteristics of the communication paths in that network.

20 120. At the time of the invention of the ’450 Patent, it was not routine,
21 conventional, or well-known in the art for devices connected to a conventional
22 broadband coaxial network in the home to operate as nodes that could send data to,
23 and receive data from other nodes on that network.

24 121. At the time of the invention of the ’450 Patent, it was not routine,
25 conventional, or well-known in the art for a device connected to a conventional
26 broadband coaxial network to send probe signals to, or receive probe signals from
27 another device on that network.

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1 122. At the time of the invention of the '450 Patent, it was not routine,
2 conventional, or well-known in the art for devices connected to a conventional
3 broadband coaxial network to determine characteristics of the channel path between
4 them.

5 123. At the time of the invention of the '450 Patent, it was not routine,
6 conventional, or well-known in the art for devices connected to a conventional
7 broadband coaxial network to communicate with another simultaneously through the
8 use of broadcast transmissions.

9 124. At the time of the invention of the '450 Patent, it was not routine,
10 conventional, or well-known in the art for a device connected to a conventional
11 broadband coaxial network to relay a common bit-loading modulation scheme to
12 other devices on a coaxial network.

13 125. At the time of the invention of the '450 Patent, it was not known in the
14 art that when transmitting data over a broadband coaxial network from one node to
15 multiple nodes it is generally more efficient to broadcast data over a common bit-
16 loading scheme than to transmit data to each receiving node using a bit-loading
17 scheme specific to each individual communication path.

18 126. **The '539 Patent.** Claim 1 of the '539 Patent recites a modem for
19 communication to at least one node across at least one channel of a coaxial network,
20 the modem comprising:

21 a transmitter; and

22 a MAC layer in signal communication with the transmitter, the MAC
23 layer using at least one probe packet as an echo profile probe to measure
24 node delay spread on the network and the MAC layer optimizing the
25 preamble and cyclic prefix requirements or other parameters in
26 response to the measured node delay spread on the network;

27 wherein the transmitter communicates the at least one probe packet.

28 ///

1 127. Claim 1 is directed to solving a technological problem in the field of
2 coaxial networks. In particular, modems on a conventional coaxial network at the
3 time of the '539 Patent did not communicate with one another, and thus did not have
4 a means for measuring the delay on the network or optimizing parameters based on
5 that measurement.

6 128. Claim 1 recites the use of probes to measure network delay spread that
7 is specific, and contributes to the improvement in coaxial networking technology that
8 allows a modem on a conventional coaxial network to communicate efficiently with
9 other nodes on that network.

10 129. Claim 1 recites the use of probes to optimize communication parameters
11 that is specific, and contributes to the improvement in conventional coaxial
12 networking technology that allows a modem on a coaxial network to communicate
13 efficiently with other nodes on that network.

14 130. Claim 1 improves the communication capabilities of modems connected
15 to a coaxial network. In particular, claim 1 recites the use of an echo profile probe to
16 measure node delay spread, which conventional coaxial networks did not measure or
17 have reason to measure. Claim 1 also recites optimizing communication parameters
18 in response to the measured delay spread, which conventional coaxial networks did
19 not do or have reason to do.

20 131. At the time of the invention of the '539 Patent, it was not routine,
21 conventional, or well-known in the art for modems connected to a conventional
22 broadband cable network to communicate with another.

23 132. At the time of the invention of the '539 Patent, it was not routine,
24 conventional, or well-known in the art for modems connected to a conventional
25 broadband cable network to transmit probe packets, let alone for the specific purpose
26 of measuring node delay spread on the network.

27 133. The element of "a MAC layer in signal communication with the
28 transmitter, the MAC layer using at least one probe packet as an echo profile probe

1 to measure node delay spread on the network” recites a technological capability that
2 was not routine or conventional in existing on-premises coaxial networks as of the
3 priority date of the ’539 Patent for the reasons explained in Paragraphs 11 to 38
4 above.

5 134. The element of “the MAC layer optimizing the preamble and cyclic
6 prefix requirements or other parameters in response to the measured node delay
7 spread on the network” recites a technological capability that was not routine or
8 conventional in existing on-premises coaxial networks as of the priority date of the
9 ’539 Patent for the reasons explained in Paragraphs 11 to 38 above.

10 **ENTROPIC INC. CONTINUES TO INNOVATE WITH IMPROVEMENTS**
11 **TO CONVENTIONAL COAXIAL NETWORKS**

12 135. Through MoCA and the inventions of the Patents-in-Suit described in
13 Paragraphs 39 through 134 above, Entropic Inc. revolutionized the delivery of high-
14 speed data networking services to customers on existing home coaxial infrastructure.
15 For example, using MoCA, cable and satellite providers were able to link multiple
16 devices in a customer’s home in a data network, allowing for a DVR device to record
17 content and stream it to another device in the home.

18 136. Now that devices in a conventional coaxial network could communicate
19 with one another due to Entropic Inc.’s inventions, a greater need arose for faster,
20 more reliable data connections to support applications such as transmitting high-
21 quality video. This became more and more apparent as customers continued to want
22 to connect more devices to their home networks.

23 137. Furthermore, Internet subscribers expected delivery of more and higher-
24 bandwidth services, including multimedia-based applications such as real-time
25 streaming of high definition (“HD”) video and entertainment. This demand for
26 higher-bandwidth services included the use of bandwidth for streaming video stored
27 on one device on a coaxial network to another device on that network in another room
28 in a subscriber’s home.

1 138. In the 2000s, system operators faced a growing challenge of supporting
2 real-time, multimedia streaming applications simultaneous with standard Internet
3 access traffic while maintaining coexistence with already existing services, such as
4 TV, within the same home network environment. Critical to effectively serving all
5 these data flows is a method to ensure that each application is guaranteed the
6 bandwidth and minimal latency necessary to provide a satisfactory user experience.

7 139. One barrier to streaming video between devices in a home over coaxial
8 network was latency in video transmission. High amounts of latency, or delay,
9 adversely affects the viewing experience. A disruption to the flow of streaming video
10 or audio can result in stuttering playback, blocky video, or a complete loss of audio,
11 which can prompt a service call from the subscriber. As a result, there was a need for
12 technical solutions that could provide quality of service (“QoS”) mechanisms to
13 control the operation of the network. These mechanisms would manage the priorities
14 of different traffic flows on the network to ensure that data was delivered in
15 accordance with the technical requirements, such as latency or throughput
16 requirements, of particular devices or applications.

17 140. Another challenge for streaming video between devices in a home over
18 a coaxial network was managing the demands for bandwidth made by the different
19 devices. This challenge arose in part from Entropic Inc.’s prior inventions, which
20 allowed for communications between devices over a coaxial network. In the mid-
21 2000s, there arose a need for technological solutions that could improve the operation
22 of a packet-based, point-to-point network over conventional coaxial installations,
23 such as a MoCA network, to provide bandwidth allocations to multiple devices in
24 these new network architectures that Entropic Inc. had made possible.

25 141. Another challenge for streaming video between devices in a home over
26 a coaxial network was establishing the role of a network coordinator to manage
27 bandwidth demands and quality of service. In point-to-point communication within
28 a packet-based network on conventional coaxial installations, such as that enabled by

1 the MoCA network architecture, no specific device in the home would be pre-defined
2 as the node that manages communications of all other devices on that network.

3 142. Instead, the devices would need to coordinate with one another to
4 determine dynamically, based on characteristics of the network, which device would
5 serve as a “Network Coordinator (NC) node.” Thus, the specific nature of the point-
6 to-point network architecture in question required new solutions for how the NC node
7 would operate in order to achieve the bandwidth allocation and quality of service
8 requirements that the network required.

9 143. As of the mid-2000s, it was not routine or conventional to distinguish
10 between types of data or to guarantee bandwidth for a type of data flow for data
11 transmitted over a logical point-to-point network running over a conventional coaxial
12 network architecture.

13 144. To address these new challenges brought on by its own prior innovative
14 work on coaxial networks, Entropic Inc. continued its inventive work in coaxial
15 networking after the initial development of MoCA 1.0.

16 145. Entropic Inc. was exclusively responsible for the development of the
17 next version of the MoCA standard, MoCA 1.1, ratified in 2007.

18 146. Entropic Inc. was also instrumental in the development of MoCA 2.0,
19 ratified in 2010.

20 **ENTROPIC INC.’S LATER INVENTIONS FURTHER IMPROVED**

21 **CONVENTIONAL COAXIAL NETWORK TECHNOLOGY**

22 147. Several of the Patents-in-Suit claim priority to 2007 to 2008. These
23 Patents-in-Suit include the ’213 Patent, the ’422 Patent, the ’0,566 Patent, and the
24 ’681 Patent.

25 148. These Patents-in-Suit, described below, recite improvements in the
26 efficiency and capabilities of the logical point-to-point networks running on top of
27 conventional coaxial networking technology.

28 ///

1 149. The claimed inventions of the Patents-in-Suit below were standardized
2 in subsequent versions of the MoCA standards.

3 150. **The '213 Patent**. Claim 1 of the '213 Patent recites a communication
4 method implemented in a Network Coordinator ("NC") node of a communication
5 network of a premises, the method comprising:

6 broadcasting to a plurality of nodes of the network, a request for a guaranteed
7 quality of service flow in the network from a source node to at least one
8 egress node, the plurality of nodes of the network to which the NC node
9 broadcasts the request including at least the source node and the at least one
10 egress node;

11 receiving a first response to the request from the source node, wherein the
12 source node is the point of origin for the purposes of the guaranteed quality
13 of service flow for data to be communicated within the guaranteed quality
14 of service flow, the first response indicating whether the source node has
15 available resources to support the guaranteed quality of service flow;

16 receiving a second response to the request from the at least one egress node
17 indicating whether the at least one egress node has available resources to
18 support the guaranteed quality of service flow; and

19 if the source node and the at least one egress node have available resources to
20 support the guaranteed quality of service flow, then allocating resources for
21 the guaranteed quality of service flow;

22 if the source node and the at least one egress node do not have available
23 resources to support the guaranteed quality of service flow, then:

24 denying the guaranteed quality of service flow; and

25 if the guaranteed quality of service flow is denied based on bandwidth-
26 related reasons, then determining a maximum data rate that would
27 have resulted in a successful request for a guaranteed quality of
28 service flow, and transmitting a message comprising information

1 describing the maximum data rate that would have resulted in a
2 successful request for a guaranteed quality of service flow.

3 151. Claim 1 of the '213 Patent is directed to improving a specific networking
4 architecture where one node functions as a "Network Coordinator (NC) node" to
5 manage quality of service for a plurality of nodes on the network. The role of an NC
6 node is not generic to networks, but arises in specific point-to-point networking
7 technologies, such as MoCA.

8 152. Claim 1 of the '213 Patent improves the technology of broadband cable
9 networking by establishing and maintaining guaranteed quality of service flows in a
10 network using specific functions of the NC node. This type of QoS mechanism has
11 since been referred to as "parameterized quality of service" or "PQoS."

12 153. Claims 3 and 4 of the '213 Patent, which depend from claim 1, recite
13 the particular technological environment of a coaxial cable-based network within a
14 home.

15 154. Prior to the invention of the '213 Patent, guaranteeing bandwidth for
16 particular data types in a network through use of an NC node was not routine,
17 conventional, or well-known.

18 155. Prior to the invention of the '213 Patent, establishing dedicated quality
19 of service flows for particular data types in a logical point-to-point network through
20 use of an NC node was not routine, conventional, or well-known.

21 156. Prior to the invention of the '213 Patent, it was not a routine,
22 conventional, or well-known activity to distinguish the types of data transmitted on
23 a logical point-to-point network through use of an NC node.

24 157. The invention of the '213 Patent enabled a new type of QoS method for
25 networks through use of an NC node that was not routine, conventional, or well-
26 known. It further improved the performance of the logical point-to-point data
27 networks formed over conventional coaxial networks.

28 ///

1 158. The elements of “a communication network of a premises,” “a plurality
2 of nodes of the network,” “a source node,” and “at least one egress node” recite a
3 particular technological environment, namely a physical communication network of
4 a premises, such as a home or office.

5 159. As described in Paragraphs 135 to 143 above, such networks faced
6 unique technological challenges as of the priority date of the ’213 Patent as
7 customers’ demand rose for higher-bandwidth services through their Internet
8 subscriptions. In particular, known QoS methods proved inadequate as video
9 streaming became more prevalent.

10 160. Claim 1 of the ’213 Patent recites multiple elements that were not
11 routine or conventional activity in the particular technological environment of logical
12 point-to-point networks that used an NC node as of the priority date of the ’213
13 Patent, including logical networks running on a conventional coaxial network.

14 161. The element of “broadcasting to a plurality of nodes of the network, a
15 request for a guaranteed quality of service flow in the network from a source node to
16 at least one egress node, the plurality of nodes of the network to which the NC node
17 broadcasts the request including at least the source node and the at least one egress
18 node” recites a technological capability that was not routine or conventional as of the
19 priority date of the ’213 Patent. As of that date, initiating a guaranteed quality of
20 service flow in a logical point-to-point network running on a conventional coaxial
21 network was not a routine or well-known activity for the reasons explained in
22 Paragraphs 135 to 143 above.

23 162. The elements of “receiving a first response to the request from the
24 source node, wherein the source node is the point of origin for the purposes of the
25 guaranteed quality of service flow for data to be communicated within the guaranteed
26 quality of service flow, the first response indicating whether the source node has
27 available resources to support the guaranteed quality of service flow” “receiving a
28 second response to the request from the at least one egress node indicating whether

1 the at least one egress node has available resources to support the guaranteed quality
2 of service flow” recite technological capabilities that were not routine or
3 conventional as of the priority date of the ’213 Patent. As of that date, determining
4 whether the endpoint nodes of a data flow have the available resources to guarantee
5 a quality of service flow in a logical point-to-point network was not a routine or well-
6 known activity for the reasons explained in Paragraphs 135 to 143 above.

7 163. The element of “if the source node and the at least one egress node have
8 available resources to support the guaranteed quality of service flow, then allocating
9 resources for the guaranteed quality of service flow” and “if the source node and the
10 at least one egress node do not have available resources to support the guaranteed
11 quality of service flow, then . . . transmitting a message comprising information
12 describing the maximum data rate that would have resulted in a successful request
13 for a guaranteed quality of service flow” recite technological capabilities that were
14 not routine or conventional as of the priority date of the ’213 Patent. As of that date,
15 establishing a guaranteed quality of service flow in a logical point-to-point network
16 if the endpoint nodes of a data flow have available resources to guarantee a particular
17 bandwidth, or alternatively determining a maximum bandwidth, was not a routine or
18 well-known activity for the reasons explained in Paragraphs 135 to 143 above.

19 164. As of the priority date of the ’213 Patent, subscribers’ on-premises
20 communication networks were not equipped to handle the growing demand for
21 Internet services, including multimedia applications such as video streaming.
22 Prioritizing data flow by data type and guaranteeing bandwidth for a particular data
23 type was not a routine or well-known activity in conventional coaxial networks for
24 the reasons explained in Paragraphs 135 to 143 above.

25 165. **The ’422 Patent.** Claim 1 of the ’422 Patent recites a communication
26 network comprising:

- 27 a requesting node;
28 a Network Coordinator (NC) node; and

1 a plurality of requested nodes,

2 wherein:

3 the requesting node is operable to, at least, communicate a first message
4 to the NC node requesting a list comprising parameterized quality of
5 service (PQoS) flows of the communication network; and

6 the NC node is operable to, at least:

7 receive the first message from the requesting node; and

8 in response to the received first message:

9 communicate a second message to each requested node of

10 the plurality of requested nodes, the second message

11 requesting from said each requested node a list

12 identifying PQoS flows for which said each requested

13 node is an ingress node;

14 receive, from said each requested node a respective third

15 message comprising a list identifying PQoS flows for

16 which said each requested node is an ingress node;

17 form an aggregated list of PQoS flows comprising each

18 respective list identifying PQoS flows from each

19 received third message; and

20 communicate a fourth message to at least the requesting

21 node comprising the aggregated list,

22 wherein the second message specifies a range of PQoS

23 flows being queried.

24 166. The '422 Patent is a family member of the '213 Patent, and as described
25 above, the type of QoS mechanism described in the '213 and '422 Patents has since
26 been referred to as "parameterized quality of service" or "PQoS."

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1 167. Claim 1 of the '422 Patent is directed to evaluating the existing
2 guaranteed quality of service flows in a logical point-to-point network that uses an
3 NC node to manage QoS.

4 168. Like the '213 Patent, Claim 1 of the '422 Patent improves the
5 technology of specific network architectures by enabling PQoS through use of an NC
6 node.

7 169. As described above with respect to the '213 Patent, the invention of the
8 '422 Patent is directed to improving the technology used in networks that rely on an
9 NC node, such as a coaxial cable-based network within a home that uses MoCA
10 technology to enable communication between all nodes in the home.

11 170. As described above with respect to the '213 Patent, prior to the invention
12 of the '422 Patent, guaranteeing bandwidth for particular data types in a logical point-
13 to-point network using an NC node, such as a MoCA network, was not routine,
14 conventional, or well-known.

15 171. Prior to the invention of the '422 Patent, establishing dedicated quality
16 of service flows for particular data types in a logical point-to-point network through
17 use of an NC node was not routine, conventional, or well-known.

18 172. Prior to the invention of the '422 Patent, it was not a routine,
19 conventional, or well-known activity to distinguish the types of data transmitted
20 through a logical point-to-point network using an NC node.

21 173. The invention of the '422 Patent enabled a new type of QoS method for
22 networks using an NC node that was not routine, conventional, or well-known. It
23 further improved the performance of logical point-to-point networks formed over
24 legacy coaxial cables or splitters that were already installed in millions of homes
25 across the United States.

26 174. The elements of “a communication network,” “a requesting node,” “a
27 Network Coordinator (NC) node,” and “a plurality of requested nodes” recite a
28

1 particular technological environment, namely a physical communication network of
2 a premises, such as a home or office.

3 175. As described in Paragraphs 135 to 143 above, such networks faced
4 unique technological challenges as of the priority date of the '422 Patent as
5 customers' demand rose for higher-bandwidth services through their Internet
6 subscriptions. In particular, known QoS methods proved inadequate as video
7 streaming became more prevalent.

8 176. Claim 1 of the '422 Patent recites multiple elements that were not
9 routine or conventional activity in the particular technological environment of
10 communications networks as of the priority date of the '422 Patent.

11 177. The elements of "communicate a first message to the NC node
12 requesting a list comprising PQoS flows of the communication network" and
13 "communicate a second message to each requested node of the plurality of requested
14 nodes, the second message requesting from said each requested node a list identifying
15 PQoS flows for which said each requested node is an ingress node" recite a
16 technological capability that was not routine or conventional as of the priority date
17 of the '213 Patent. As of that date, requesting a list of existing guaranteed quality of
18 service flows in a network was not a routine or well-known activity for the reasons
19 explained in Paragraphs 135 to 143 above.

20 178. The element of "receive, from said each requested node a respective
21 third message comprising a list identifying PQoS flows for which said each requested
22 node is an ingress node" recites a technological capability that was not routine or
23 conventional as of the priority date of the '213 Patent. As of that date, identifying
24 resource commitments of existing guaranteed quality of service flows of a source or
25 ingress node in a logical point-to-point network was not a routine or well-known
26 activity for the reasons explained in Paragraphs 135 to 143 above.

27 179. The element of "form an aggregated list of PQoS flows comprising each
28 respective list identifying PQoS flows from each received third message" recites a

1 technological capability that was not routine or conventional as of the priority date
2 of the '213 Patent. As of that date, identifying and aggregating resource commitments
3 of existing guaranteed quality of service flows of all source or ingress nodes in a
4 logical point-to-point network was not a routine or well-known activity for the
5 reasons explained in Paragraphs 135 to 143 above.

6 180. As of the priority date of the '422 Patent, subscribers' on-premise
7 communication networks were not equipped to handle the growing demand for
8 Internet services, including multimedia application such as video streaming.
9 Prioritizing data flow by data type and guaranteeing bandwidth for a particular data
10 type was not a routine or well-known activity in conventional coaxial networks for
11 the reasons explained in Paragraphs 135 to 143 above.

12 181. **The '0,566 Patent.** Claim 1 of the '0,566 Patent recites a method for
13 communications transmission using orthogonal frequency division multiple access
14 on a network comprising:

- 15 a) providing a plurality of transmitting network devices with a set of available
16 subcarriers for orthogonal frequency division multiple access;
- 17 b) providing a corresponding element of a pseudorandom noise sequence for
18 each subcarrier of the set of available subcarriers;
- 19 c) allocating a subset of the set of available subcarriers to each of the
20 transmitting network devices;
- 21 d) a transmitting network device of the plurality of devices mapping a packet
22 onto a plurality of used subcarriers of its allocated subset of available
23 subcarriers, wherein the step of mapping the packet comprises mapping the
24 packet onto a plurality of quadrature amplitude modulated symbols to be
25 transmitted on the used subcarriers;
- 26 e) the transmitting network device performing a predetermined transformation
27 on a quadrature amplitude modulated symbol using the element of the
28 pseudorandom noise sequence corresponding to the used subcarrier;

1 f) the transmitting network device transmitting the transformed symbol to a
2 receiving network device.

3 182. Claim 1 of the '0,566 Patent is directed to solving a technological
4 problem in the field of broadband coaxial networks. In particular, with the many
5 continued advancements in data communication technology in the 2000s, as
6 described above in Paragraphs 135 to 143, more and more devices were being
7 introduced into home data networks with high bandwidth communications
8 capabilities, and subscribers were expecting delivery of more and higher-bandwidth
9 services such as HD video streaming. This increase in demand presented technical
10 challenges to data networks formed on existing coaxial networks.

11 183. Claim 1 improves the performance of a coaxial communications
12 network by enabling multiple transmitting network devices to transmit under an
13 orthogonal frequency divisional multiple access ("OFDMA") scheme to a receiving
14 network device. Such a communications method enables the efficient allocation of
15 bandwidth among various communicating devices on the network.

16 184. At the time of the invention of the '0,566 Patent, employing OFDMA
17 schemes on a coaxial network was not routine, conventional, or well-known.

18 185. At the time of the invention of the '0,566 Patent, it was not a routine,
19 conventional, or well-known activity to provide, on a conventional coaxial network,
20 "a plurality of transmitting network devices with a set of available subcarriers for
21 orthogonal frequency division multiple access" and "a corresponding element of a
22 pseudorandom noise sequence for each subcarrier of the set of available subcarriers."

23 186. At the time of the invention of the '0,566 Patent, it was not a routine,
24 conventional, or well-known activity to allocate, on a conventional coaxial network,
25 "a subset of the set of available subcarriers to each of the transmitting network
26 devices."

27 187. At the time of the invention of the '0,566 Patent, it was not a routine,
28 conventional, or well-known activity for a network device on a coaxial data network

1 to “map[] a packet onto a plurality of used subcarriers of its allocated subset of
2 available subcarriers, wherein the step of mapping the packet comprises mapping the
3 packet onto a plurality of quadrature amplitude modulated symbols to be transmitted
4 on the used subcarriers,” to “perform[] a predetermined transformation on a
5 quadrature amplitude modulated symbol using the element of the pseudorandom
6 noise sequence corresponding to the used subcarrier,” or to “transmit[] the
7 transformed symbol to a receiving network device.”

8 188. The invention of the ’0,566 Patent enabled a new and more efficient data
9 communication scheme (i.e., OFMDA) over existing on-premises coaxial networks
10 that was not routine, conventional, or well-known. It achieved this innovation
11 without requiring changes to the legacy coaxial cables or splitters that were already
12 installed in millions of homes across the United States.

13 189. **The ’681 Patent.** Claim 1 of the ’681 Patent recites a method for
14 synchronizing a plurality of nodes on a communication network, comprising:

15 exchanging a local clock time between a first node and a second node over the
16 communication network, wherein the exchange comprises:

17 transmitting a first packet from the first node to the second node,
18 wherein the first packet includes a first packet clock time set to the
19 local clock time of the first node at transmission time, and includes
20 a scheduled arrival clock time, and

21 setting the local clock time of the second node to the first packet clock
22 time;

23 performing a ranging method between the first and second nodes based on the
24 local clock time exchanged, wherein the ranging method results in an
25 estimated propagation delay between the first and second node, and
26 wherein the ranging method comprises:

27 transmitting a second packet from the second node to the first node,
28 wherein the second packet is transmitted from the second node at the

1 scheduled arrival clock time, and wherein the second packet is
2 received by the first node at an actual arrival clock time,
3 calculating and storing the estimated propagation delay at the first node,
4 wherein calculating the estimated propagation delay is based on the
5 scheduled arrival clock time and the actual arrival time, and
6 transmitting a third packet from the first node to the second node,
7 wherein the third packet comprises the estimated propagation delay;
8 and
9 adjusting the local clock time of either the first or second node based on the
10 estimated propagation delay, thereby resulting in a synchronized local
11 clock time between the first and second node.

12 190. Claim 1 of the '681 Patent is directed to solving a technological problem
13 in the field of broadband coaxial networks. In particular, with the many continued
14 advancements in data communication technology in the 2000s, as described above in
15 Paragraphs 135 to 143, more and more devices are being introduced into home data
16 networks with high bandwidth communications capabilities, and subscribers were
17 expecting delivery of more and higher-bandwidth services such as HD video
18 streaming. This increase in demand presented technical challenges to data networks
19 formed on existing coaxial networks.

20 191. Claim 1 of the '681 Patent recites an improvement in clock
21 synchronization that solves a problem in estimating and accounting for propagation
22 delay. The solution is directed to logical point-to-point networks, such as coaxial
23 networks using MoCA technology, that require an estimate of propagation delay in a
24 multipath environment where the propagation delay between two nodes is not known
25 in advance, can vary dynamically based on changes in the channel path
26 characteristics between them, and where the delay between two nodes in one
27 direction can differ from the delay in the opposite direction.

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1 192. At the time of the invention of the '681 Patent, it was not a routine,
2 conventional, or well-known activity to exchange, on a conventional coaxial
3 network, “a local clock time between a first node and a second node over the
4 communication network” involving “transmitting a first packet from the first node to
5 the second node, wherein the first packet includes a first packet clock time set to the
6 local clock time of the first node at transmission time, and includes a scheduled
7 arrival clock time” and “setting the local clock time of the second node to the first
8 packet clock time.”

9 193. At the time of the invention of the '681 Patent, it was not a routine,
10 conventional, or well-known activity to “perform[] a ranging method between the
11 first and second nodes based on the local clock time exchanged, wherein the ranging
12 method results in an estimated propagation delay between the first and second node”
13 involving “transmitting a second packet from the second node to the first node,
14 wherein the second packet is transmitted from the second node at the scheduled
15 arrival clock time, and wherein the second packet is received by the first node at an
16 actual arrival clock time,” “calculating and storing the estimated propagation delay
17 at the first node, wherein calculating the estimated propagation delay is based on the
18 scheduled arrival clock time and the actual arrival time,” and “transmitting a third
19 packet from the first node to the second node, wherein the third packet comprises the
20 estimated propagation delay.”

21 194. At the time of the invention of the '681 Patent, it was not a routine,
22 conventional, or well-known activity to “adjust[] the local clock time of either the
23 first or second node based on the estimated propagation delay, thereby resulting in a
24 synchronized local clock time between the first and second node.”

25 195. The invention of the '681 Patent enabled improvements to the efficiency
26 of conventional coaxial networks that were not routine, conventional, or well-known.
27 It achieved this innovation without requiring changes to the legacy coaxial cables and
28 splitters that were already installed in millions of homes across the United States.

THE ACCUSED MOCA INSTRUMENTALITIES AND
ACCUSED SERVICES

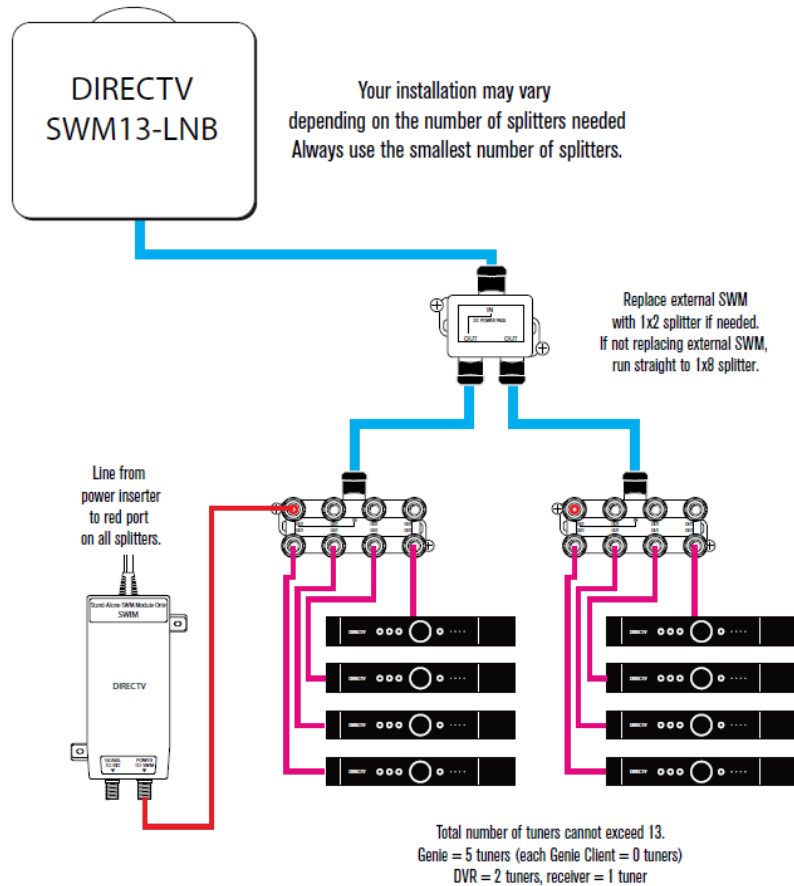
196. DIRECTV utilizes various instrumentalities, deployable as nodes in a MoCA-compliant coaxial cable network.

197. DIRECTV deploys the instrumentalities to, *inter alia*, provide a whole-premises DVR network over an on-premises coaxial cable network, with products including DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and DIRECTV HS17 (and devices that operate in a similar manner) serving as nodes operating with data connections compliant with MoCA 1.0, 1.1, and/or 2.0. Such components are referred to herein as the “Accused MoCA Instrumentalities.” The MoCA-compliant services offered by DIRECTV employing the Accused MoCA Instrumentalities, including the operation of a MoCA-compliant network in which such instrumentalities are deployed, are referred to herein as the “Accused Services.”

198. An exemplary illustration of the topology of various Accused MoCA Instrumentalities in a DIRECTV deployment is pictured below.¹

¹ This is an example of the products used in the infringing network and is not intended to limit the scope of products accused of infringement.

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199. Upon information and belief, the Accused MoCA Instrumentalities form networks over a coaxial cable network in accordance with the MoCA 1.0, 1.1, and/or 2.0.

200. Specifically, upon information and belief, DIRECTV instrumentalities including the DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and DIRECTV HS17 form networks over a coaxial cable network in accordance with MoCA 1.0, 1.1, and/or 2.0.

201. Most commonly, the Accused Services are offered and provided in exchange for fees paid to DIRECTV.

202. DIRECTV itself also sometimes tests and demonstrates the Accused Services, by means of Accused MoCA Instrumentalities.

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1 203. In some deployments of the Accused MoCA Instrumentalities and the
2 performance of the Accused Services, DIRECTV uses one or more of the DIRECTV
3 C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV C61K, DIRECTV
4 HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and DIRECTV HS17
5 (and devices that operate in a similar manner), to provide signals, programming and
6 content utilizing a data connection carried over a coaxial cable network in accordance
7 with the MoCA standards.

8 204. In or about January 2013 Rudy Ramirez, in his capacity as DIRECTV
9 Panamericana's senior director of product development, stated that MoCA
10 technology "will allow for simpler home network installations and home topology
11 that will allow us to provide our customers with the best entertainment experience in
12 the region."²

13 205. Upon information and belief, Mr. Ramirez, and/or other authorized
14 DIRECTV or DIRECTV Panamericana personnel authorized the publication and
15 attribution of the preceding quote to Mr. Ramirez.

16 206. In January 2010, Romulo Pontual, in his capacity as DIRECTV's chief
17 technology officer stated, "[b]y integrating MoCA technology into our STBs along
18 with the existing deployment of Single Wire Multiswitch, we will set ourselves apart
19 from the competition as a leading provider of connected home technology."³

20 207. Upon information and belief, Mr. Pontual, and/or other authorized
21 DIRECTV personnel authorized the publication and attribution of the preceding
22 quotation to Mr. Pontual.

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25 ²[https://www.globenewswire.com/news-](https://www.globenewswire.com/news-release/2013/01/08/515194/9308/en/DIRECTV-PanAmericana-Selects-Entropic-s-Silicon-and-Software-to-Roll-Out-Advanced-TV-Viewing-Services.html)
26 [release/2013/01/08/515194/9308/en/DIRECTV-PanAmericana-Selects-Entropic-s-](https://www.globenewswire.com/news-release/2013/01/08/515194/9308/en/DIRECTV-PanAmericana-Selects-Entropic-s-Silicon-and-Software-to-Roll-Out-Advanced-TV-Viewing-Services.html)
[Silicon-and-Software-to-Roll-Out-Advanced-TV-Viewing-Services.html](https://www.globenewswire.com/news-release/2013/01/08/515194/9308/en/DIRECTV-PanAmericana-Selects-Entropic-s-Silicon-and-Software-to-Roll-Out-Advanced-TV-Viewing-Services.html)

27 ³ [https://www.globenewswire.com/news-](https://www.globenewswire.com/news-release/2010/01/25/412869/9308/en/Entropic-Communications-Silicon-Selected-by-DIRECTV-for-Home-Networking-Deployments.html)
28 [release/2010/01/25/412869/9308/en/Entropic-Communications-Silicon-Selected-](https://www.globenewswire.com/news-release/2010/01/25/412869/9308/en/Entropic-Communications-Silicon-Selected-by-DIRECTV-for-Home-Networking-Deployments.html)
[by-DIRECTV-for-Home-Networking-Deployments.html](https://www.globenewswire.com/news-release/2010/01/25/412869/9308/en/Entropic-Communications-Silicon-Selected-by-DIRECTV-for-Home-Networking-Deployments.html)

1 208. In or about January 2012, Mike Pulli, in his capacity as CEO of Pace
2 Americas, the manufacturer and/or supplier of DIRECTV receivers, announced that
3 MoCA was a core requirement in DIRECTV receivers.⁴

4 209. Upon information and belief, DIRECTV required that its receivers be
5 equipped with MoCA capabilities in at least 2012.

6 210. Upon information and belief, DIRECTV continues to require that
7 certain of DIRECTV's set top boxes have MoCA capabilities.

8 211. DIRECTV was aware of its deployment and use of MoCA at least as
9 early as the later of its involvement with MoCA and six years prior to the filing of
10 this complaint.

11 212. Upon information and belief, DIRECTV was aware that Entropic Inc.
12 invented technology underlying the MoCA standards. Accordingly, such Entropic
13 Inc. technology would be incorporated into any instrumentality compliant with the
14 MoCA standards.

15 213. Upon information and belief, DIRECTV and/or its subsidiaries was a
16 member of MoCA beginning in 2012 through at least October, 2019, providing it
17 with full access to then-existing versions of the MoCA standards.

18 214. Upon information and belief, DIRECTV was aware that Entropic Inc.
19 intended to and did pursue patent protection for technology related to MoCA, at least
20 as early as the later of its involvement with MoCA and the issue date of the Asserted
21 Patents.

22 215. When DIRECTV obtained, deployed and/or used instrumentalities with
23 MoCA functionality not provided by Entropic Inc., DIRECTV knew or should have
24 known that Entropic Inc. had provided no authorization for such activities, for
25 example by a patent license.

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27 ⁴ [https://www.globenewswire.com/en/news-](https://www.globenewswire.com/en/news-release/2012/01/11/465253/9308/en/Entropic-Communications-Powers-the-Pace-HR34-Home-Media-Center-HD-DVR-for-DIRECTV.html)
28 [release/2012/01/11/465253/9308/en/Entropic-Communications-Powers-the-Pace-](https://www.globenewswire.com/en/news-release/2012/01/11/465253/9308/en/Entropic-Communications-Powers-the-Pace-HR34-Home-Media-Center-HD-DVR-for-DIRECTV.html)
[HR34-Home-Media-Center-HD-DVR-for-DIRECTV.html](https://www.globenewswire.com/en/news-release/2012/01/11/465253/9308/en/Entropic-Communications-Powers-the-Pace-HR34-Home-Media-Center-HD-DVR-for-DIRECTV.html)

1 216. Upon information and belief, when DIRECTV obtained, deployed
2 and/or used instrumentalities with MoCA functionality not provided by Entropic Inc.,
3 DIRECTV failed to investigate whether Entropic Inc. authorized the use of Entropic
4 Inc.'s patents for such activity.

5 217. Alternatively, upon information and belief, when DIRECTV obtained,
6 deployed and/or used instrumentalities with MoCA functionality not provided by
7 Entropic Inc., DIRECTV knew the use of Entropic Inc.'s patents for such activity
8 was not authorized by Entropic Inc.

9 **ENTROPIC ACQUIRES THE PATENTS AND CONTACTS DIRECTV**
10 **ABOUT TAKING A LICENSE TO THE ASSERTED PATENTS**

11 218. Entropic Inc. achieved technological and commercial success from its
12 inventive work with coaxial networks throughout the 2000s.

13 219. In addition to its work on MoCA and the inventions that enabled it,
14 Entropic Inc. also developed Direct Broadcast Satellite ("DBS") Outdoor Unit
15 ("ODU") single-wire technology, and System-on-Chip ("SoC") solutions for set-top
16 boxes ("STBs") in the home television and home video markets.

17 220. Under the technical guidance of Dr. Monk, Entropic Inc. grew to be
18 publicly listed on the NASDAQ in 2007. After the public listing, the company
19 acquired RF Magic, Inc. in 2007, a company specializing in DBS ODU technology
20 and related hardware.

21 221. Additional growth between 2007 and 2015 bolstered the technical
22 expertise of Entropic Inc. with respect to signal acquisition, stacking, filtering,
23 processing, and distribution for STBs and cable modems.

24 222. In 2015, MaxLinear, Inc. ("MaxLinear")—a leading provider of radio-
25 frequency, analog, digital, and mixed-signal semiconductor solutions—acquired
26 Entropic Inc., and the pioneering intellectual property developed by Dr. Monk and
27 his team.

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1 223. In 2021, Plaintiff Entropic Communications, LLC was established.

2 224. In 2021, MaxLinear transferred to Entropic a portfolio of intellectual
3 property representing the innovations of Entropic and MaxLinear in the cable and
4 satellite services markets.

5 225. Prior to filing this Complaint, Entropic contacted DIRECTV numerous
6 times in an attempt to reach a license agreement with DIRECTV regarding Entropic's
7 patent portfolio, including discussions aimed at the field of technology standardized
8 by the MoCA.

9 226. On March 9, 2022, Entropic sent a communication by electronic means
10 to DIRECTV, including the Patents-in-Suit.

11 227. On December 23, 2022, and January 2, 2023, Entropic sent DIRECTV
12 another communication by both physical and electronic means regarding a separate
13 license to Entropic's patents for the field of the standardized networking technology
14 commonly called MoCA, and also seeking to discuss with DIRECTV a typical non-
15 disclosure agreement in order to share such information.

16 228. The parties subsequently entered a non-disclosure agreement to permit
17 licensing discussions. However, as of now DIRECTV has not taken a license to any
18 patent owned by Entropic, including the Patents-in-Suit.

19 229. In early February 2023, Entropic provided DIRECTV copies of claim
20 charts illustrating DIRECTV's patent infringement of each Asserted Patent by virtue
21 of DIRECTV's deployment of MoCA technology.

22 230. As of at least February 17, 2023, DIRECTV has been on notice of
23 Entropic's assertions of infringement of the Asserted Patents.

24 **JURISDICTION AND VENUE**

25 231. This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331
26 and 1338(a) because the claims herein arise under the patent laws of the United
27 States, 35 U.S.C. § 1 et seq., including 35 U.S.C. § 271.

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1 232. Venue in this Judicial District is proper under 28 U.S.C. § 1400(b)
2 because DIRECTV has regular and established places of business in this District.
3 DIRECTV, by itself and/or through its agents have committed acts of patent
4 infringement within the State of California and in this Judicial District by making,
5 importing, using, selling, offering for sale, and/or leasing the Accused MoCA
6 Instrumentalities, as well as Accused Services employing the Accused MoCA
7 Instrumentalities, that comply with one or more of MoCA 1.0, 1.1, and/or 2.0.

8 233. This Court currently has before it another case involving the same
9 parties that also concerns DIRECTV providing satellite television services to its
10 customers, including those in this Judicial District. *Entropic Comm's. LLC v.*
11 *DIRECTV LLC*, Case No. 2:22-cv-07775-JWH-JEM (*DIRECTV I CDCA*). That co-
12 pending matter was transferred to this Court from the Eastern District of Texas on
13 October 26, 2022 on motion from the DIRECTV defendants, which alleged that such
14 matter could have been properly brought originally in this Judicial District. *See*
15 *DIRECTV I CDCA*, Dkt. No. 110.

16 234. Venue in this Judicial District of California is proper pursuant to 28
17 U.S.C. § 1400(b), because DIRECTV has regular and established places of business
18 in this District, and have committed acts of patent infringement in this Judicial
19 District. DIRECTV has committed acts of patent infringement within the State of
20 California and in this Judicial District by making, using, selling, offering for sale,
21 and/or leasing the Accused MoCA Instrumentalities, as well as Accused Services
22 employing the Accused MoCA Instrumentalities, that comply with one or more of
23 MoCA 1.0, 1.1, and/or 2.0.

24 235. This Court has general personal jurisdiction over the DIRECTV
25 defendants because the DIRECTV defendants conduct systematic and regular
26 business within the State of California by, *inter alia* providing satellite television and
27 internet services to businesses and residents throughout this State.

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1 236. This Court has general personal jurisdiction over AT&T because AT&T
2 conducts systematic and regular business within the State of California by, *inter alia*
3 providing telephone, satellite television and internet services to businesses and
4 residents throughout this State.

5 237. The Court has specific personal jurisdiction over DIRECTV because it
6 has committed acts of infringement within the State of California and this Judicial
7 District through, for example, making infringing networks using the Accused MoCA
8 Instrumentalities, and using the Accused MoCA Instrumentalities to provide the
9 Accused Services in the State of California and this Judicial District.

10 238. DIRECTV's regular and established places of business within this
11 District are used to conduct DIRECTV's business, i.e. the development,
12 maintenance, and provision of the Accused Services and Accused MoCA
13 Instrumentalities.

14 239. DIRECTV's business in this Judicial District includes employing
15 hardware and software engineers who developed and maintain the Accused MoCA
16 Instrumentalities and related software.

17 240. Upon information and belief, DIRECTV, by itself and/or through its
18 agents offers various telecommunication services throughout the United States.
19 DIRECTV operates and maintains a nationwide television and data network through
20 which DIRECTV sells, leases, and offers for sale or lease products and services,
21 including the Accused MoCA Instrumentalities, to businesses, consumers, and
22 government agencies. DIRECTV offers to sell, sells, and provides DIRECTV
23 branded products and services, including, set top boxes and digital video, audio, and
24 other content services to customers. Subscribers to DIRECTV's television services
25 receive one or more receivers and/or set-top boxes, within this Judicial District.

26 241. Upon information and belief, AT&T, by itself and/or through its agents
27 has offered and continues to offer various "DIRECTV" branded telecommunication
28 services throughout the United States. AT&T has operated and maintained a

1 nationwide television and data network through which AT&T sold, leased, offered
2 for sale, sells, leases, and offered for sale and/or continues to do so, products and
3 services, including the Accused MoCA Instrumentalities, to businesses, consumers,
4 and government agencies. AT&T offers to sell, sells, and provides DIRECTV
5 branded products and services, including, set top boxes and digital video, audio, and
6 other content services to customers. Subscribers to the “DIRECTV” branded
7 television services receive one or more receivers and/or set-top boxes, within this
8 Judicial District.

9 242. Upon information and belief, DIRECTV provides the Accused Services
10 and Accused MoCA Instrumentalities throughout the United States and in this
11 Judicial District.

12 243. Upon information and belief, DIRECTV employs and/or contracts with
13 persons and directs them to install, service, repair, and/or replace equipment, as
14 appropriate, in this District.

15 244. Venue is further proper because DIRECTV has committed and
16 continues to commit acts of patent infringement in this Judicial District, including,
17 making, using, importing, offering to sell, and/or selling Accused Services and
18 Accused MoCA Instrumentalities, and MoCA networks, and thereafter providing
19 Accused Services in this Judicial District, including by Internet sales and sales via
20 retail and wholesale stores. Furthermore, for example, DIRECTV deploys Accused
21 MoCA Instrumentalities to many thousands of locations (customer premises) in this
22 Judicial District and subsequently, by means of those Accused MoCA
23 Instrumentalities, uses the claimed inventions at those locations in this Judicial
24 District. DIRECTV infringes by inducing and contributing to acts of patent
25 infringement in this Judicial District and/or committing at least a portion of any other
26 infringements alleged herein in this Judicial District.

27 245. DIRECTV continues to conduct business in this Judicial District,
28 including the acts and activities described in the preceding paragraph.

1 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
2 DIRECTV HS17) in connection with operating and providing the Accused Services.

3 254. The Accused MoCA Instrumentalities deployed by DIRECTV to
4 customer premises remain the property of DIRECTV while deployed.

5 255. The Accused MoCA Instrumentalities operate while deployed in a
6 manner controlled and intended by DIRECTV.

7 256. As set forth in the attached non-limiting claim chart (Exhibit B), any
8 product or system operating in a MoCA network compliant with the charted
9 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 1 of the
10 '518 Patent.

11 257. Each aspect of the functioning of the Accused MoCA Instrumentalities
12 described in the claim chart operates while deployed to customer premises in a
13 manner controlled and intended by DIRECTV.

14 258. DIRECTV provides no software, support or other facility to customers
15 to modify any aspect of the functioning described in the claim chart of the Accused
16 MoCA Instrumentalities while deployed to customer premises.

17 259. The Accused MoCA Instrumentalities are compliant with the provisions
18 of MoCA 1.0, 1.1., and/or 2.0, as described in the '518 Patent claim chart, Exhibit B.

19 260. DIRECTV therefore directly infringes at least claim 1 of the '518 Patent
20 by using the Accused MoCA Instrumentalities to provide Accused Services to
21 customers.

22 261. DIRECTV directly infringes at least claim 1 of the '518 Patent when it,
23 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
24 otherwise provide Accused Services.

25 262. DIRECTV directly infringes at least claim 1 of the '518 Patent by
26 making, importing, selling, and/or offering for sale the Accused MoCA
27 Instrumentalities in connection with providing the Accused Services over an
28

1 on-premises coaxial cable network, which meets each and every element of at least
2 claim 1 of the '518 Patent.

3 263. DIRECTV had knowledge of the '518 Patent no later than its receipt of
4 Entropic's communications sent to DIRECTV on March 9, 2022.

5 264. DIRECTV has been aware that it infringes the '518 Patent since at least
6 as early as receipt of Entropic's communications sent to DIRECTV on March 9,
7 2022.

8 265. DIRECTV has known of or has been willfully blind to the '518 Patent
9 since before the March 9, 2022 communications from Entropic.

10 266. The '518 Patent issued while or before DIRECTV was a member of
11 MoCA.

12 267. Because of DIRECTV's knowledge of Entropic Inc.'s work and
13 contributions related to MoCA technology, DIRECTV had knowledge of the '518
14 Patent before March 9, 2022 or was willfully blind to its existence.

15 268. DIRECTV has been aware of its infringement of the '518 Patent no later
16 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
17 infringement of the '518 Patent by MoCA technology, which is deployed by
18 DIRECTV. The claim charts DIRECTV received approximately three months before
19 the filing of this Complaint show that the claims of the '518 Patent are essential to
20 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

21 269. The claims of the '518 Patent are essential to practicing at least MoCA
22 standards versions 1.0, 1.1, and/or 2.0.

23 270. DIRECTV knew, or was willfully blind to the fact that the technology
24 of the '518 Patent directly relates to networking over coaxial cable, including MoCA,
25 at least as early as DIRECTV became aware of the existence of the '518 Patent.
26 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
27 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
28

1 instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver DIRECTV
2 services would necessarily infringe one or more claims of the '518 Patent.

3 271. Since learning of the '518 Patent and its infringing activities, DIRECTV
4 has failed to cease its infringing activities.

5 272. DIRECTV's customers and subscribers directly infringe at least claim 1
6 of the '518 Patent by using the Accused MoCA Instrumentalities in connection with
7 the Accused Services provided by DIRECTV.

8 273. DIRECTV actively induces its customers' and subscribers' direct
9 infringement by providing the Accused Services and associated support.

10 274. For example, DIRECTV actively induces infringement of at least claim
11 1 of the '518 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
12 customers with specific instructions and/or assistance (including installation and
13 maintenance) regarding the instantiation of a MoCA network and the use of the
14 Accused MoCA Instrumentalities in a manner that infringes the '518 Patent.

15 275. DIRECTV aids, instructs, supports, and otherwise acts with, the intent
16 to cause an end user to make and/or use the MoCA network and/or use the Accused
17 MoCA Instrumentalities in a manner that infringes each and every element of at least
18 claim 1 of the '518 Patent.

19 276. Additionally, DIRECTV contributes to the customers' and subscribers'
20 direct infringement. DIRECTV provides at least the Accused MoCA
21 Instrumentalities that create and are at least substantially all of a MoCA network to
22 be used to infringe at least claim 1 of the '518 Patent.

23 277. The Accused MoCA Instrumentalities have no substantial noninfringing
24 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
25 the Accused Services provided by DIRECTV, the end user necessarily directly
26 infringes at least claim 1 of the '518 Patent. The Accused MoCA Instrumentalities
27 are therefore especially made or especially adapted for use in an infringing manner.

28 ///

1 claims 1, 5, and 10 are independent. At least these claims of the '249 Patent are
2 directed to the creation of the MoCA network using the on-premises coaxial cable
3 wiring. A true and accurate copy of the '249 Patent is attached hereto as Exhibit C.

4 286. The '249 Patent is directed to patent-eligible subject matter pursuant to
5 35 U.S.C. § 101.

6 287. The '249 Patent is valid and enforceable, and presumed as such,
7 pursuant to 35 U.S.C. § 282.

8 288. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
9 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
10 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
11 DIRECTV HS17) in connection with operating and providing the Accused Services.

12 289. The Accused MoCA Instrumentalities deployed by DIRECTV to
13 customer premises remain the property of DIRECTV while deployed.

14 290. The Accused MoCA Instrumentalities operate while deployed in a
15 manner controlled and intended by DIRECTV.

16 291. As set forth in the attached non-limiting claim chart (Exhibit D), any
17 product or system operating in a MoCA network compliant with the charted
18 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 10 of the
19 '249 Patent.

20 292. Each aspect of the functioning of the Accused MoCA Instrumentalities
21 described in the claim chart operates while deployed to customer premises in a
22 manner controlled and intended by DIRECTV.

23 293. DIRECTV provides no software, support or other facility to customers
24 to modify any aspect of the functioning described in the claim chart of the Accused
25 MoCA Instrumentalities while deployed to customer premises.

26 294. The Accused MoCA Instrumentalities are compliant with MoCA 1.0,
27 1.1., and/or 2.0, as described in the '249 Patent claim chart, Exhibit D.

28 ///

1 295. DIRECTV therefore directly infringes at least claim 10 of the '249
2 Patent by using the Accused MoCA Instrumentalities to provide Accused Services to
3 customers.

4 296. DIRECTV directly infringes at least claim 10 of the '249 Patent when
5 it, for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
6 otherwise provide Accused Services.

7 297. DIRECTV directly infringes at least claim 10 of the '249 Patent by
8 making, importing, selling, and/or offering for sale the Accused MoCA
9 Instrumentalities in connection with providing the Accused Services over an
10 on-premises coaxial cable network, which meets each and every element of at least
11 claim 10 of the '249 Patent.

12 298. DIRECTV had knowledge of the '249 Patent no later than its receipt of
13 Entropic's communications sent to DIRECTV on March 9, 2022.

14 299. DIRECTV has been aware that it infringes the '249 Patent no later than
15 its receipt of Entropic's communications sent to DIRECTV on March 9, 2022.

16 300. DIRECTV has known of or has been willfully blind to the '249 Patent
17 since before the March 9, 2022 communications from Entropic.

18 301. The '249 Patent issued while or before DIRECTV was a member of
19 MoCA.

20 302. Because of DIRECTV's knowledge of Entropic Inc.'s work and
21 contributions related to MoCA technology, DIRECTV had knowledge of the '249
22 Patent before March 9, 2022 or was willfully blind to its existence.

23 303. DIRECTV has been aware of its infringement of the '249 Patent no later
24 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
25 infringement of the '249 Patent by MoCA technology, which is deployed by
26 DIRECTV. The claim charts DIRECTV received approximately three months before
27 the filing of this Complaint show that the claims of the '249 Patent are essential to
28 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

1 304. The claims of the '249 Patent are essential to practicing at least MoCA
2 standards versions 1.0, 1.1, and/or 2.0.

3 305. DIRECTV knew, or was willfully blind to the fact that the technology
4 of the '249 Patent directly relates to networking over coaxial cable, including MoCA,
5 at least as early as DIRECTV became aware of the existence of the '249 Patent.
6 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
7 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
8 instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver DIRECTV
9 services would necessarily infringe one or more claims of the '249 Patent.

10 306. Since learning of the '249 Patent and its infringing activities, DIRECTV
11 has failed to cease its infringing activities.

12 307. DIRECTV's customers and subscribers directly infringe at least claim
13 10 of the '249 Patent by using the Accused MoCA Instrumentalities in connection
14 with the Accused Services provided by DIRECTV.

15 308. DIRECTV actively induces its customers' and subscribers' direct
16 infringement by providing the Accused Services and associated support.

17 309. For example, DIRECTV actively induces infringement of at least claim
18 10 of the '249 Patent by providing the Accused MoCA Instrumentalities to
19 DIRECTV customers with specific instructions and/or assistance (including
20 installation and maintenance) regarding the instantiation of a MoCA network and the
21 use of the Accused MoCA Instrumentalities in a manner that infringes the '249
22 Patent.

23 310. DIRECTV aids, instructs, supports, and otherwise acts with the intent
24 to cause an end user to make and/or use the MoCA network and/or use the Accused
25 MoCA Instrumentalities in a manner that infringes every element of at least claim 10
26 of the '249 Patent.

27 311. Additionally, DIRECTV contributes to the customers' and subscribers'
28 direct infringement. DIRECTV provides at least the Accused MoCA

1 Instrumentalities that create and are at least substantially all of a MoCA network to
2 be used to infringe at least claim 10 of the '249 Patent.

3 312. The Accused MoCA Instrumentalities have no substantial noninfringing
4 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
5 the Accused Services provided by DIRECTV, the end user necessarily directly
6 infringes at least claim 10 of the '249 Patent. The Accused MoCA Instrumentalities
7 are therefore especially made or especially adapted for use in an infringing manner.

8 313. DIRECTV's inducement of, and contribution to, the direct infringement
9 of at least claim 10 of the '249 Patent has been, and is, continuous and ongoing
10 through the acts described above in connection with DIRECTV's provision of the
11 Accused Services.

12 314. DIRECTV's infringement of the '249 Patent is, has been, and continues
13 to be willful, intentional, deliberate, and/or in conscious disregard for Entropic's
14 rights under the patent.

15 315. Entropic has been damaged as a result of the infringing conduct alleged
16 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
17 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
18 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

19 316. Entropic is aware of no obligation to mark any instrumentality with the
20 '249 Patent in accordance with 35 U.S.C. § 287.

21 **COUNT III**

22 **(Infringement of the '759 Patent)**

23 317. Entropic incorporates by reference each allegation of Paragraphs 1
24 through 144.

25 318. The '759 Patent duly issued on February 15, 2011 from an application
26 filed July 12, 2004, an application filed August 29, 2002, and, *inter alia* a provisional
27 application filed August 30, 2001.

28 ///

1 319. Entropic owns all substantial rights, interest, and title in and to the '759
2 Patent, including the sole and exclusive right to prosecute this action and enforce the
3 '759 Patent against infringers, and to collect damages for all relevant times.

4 320. The '759 Patent is generally directed to, *inter alia*, broadband cable
5 networks that allow devices to communicate directly over the existing coaxial cable
6 with its current architecture without the need to modify the existing cable
7 infrastructure. Each device communicates with the other devices in the network and
8 establishes a common modulation scheme between the devices in the network. '759
9 Patent, Abstract. The '759 Patent has 22 claims, of which claims 1–7, 14, 20–22 are
10 independent. At least these claims of the '759 Patent are directed to a variety of
11 techniques for establishing a modulation scheme for communications between nodes
12 in the MoCA network. A true and correct copy of the '759 Patent is attached hereto
13 as Exhibit E.

14 321. The '759 Patent is directed to patent-eligible subject matter pursuant to
15 35 U.S.C. § 101.

16 322. The '759 Patent is valid and enforceable, and presumed as such,
17 pursuant to 35 U.S.C. § 282.

18 323. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
19 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
20 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
21 DIRECTV HS17) in connection with operating and providing the Accused Services.

22 324. The Accused MoCA Instrumentalities deployed by DIRECTV to
23 customer premises remain the property of DIRECTV while deployed.

24 325. The Accused MoCA Instrumentalities operate while deployed in a
25 manner controlled and intended by DIRECTV.

26 326. As set forth in the attached non-limiting claim chart (Exhibit F), any
27 product or system operating in a MoCA network compliant with the charted
28

1 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 2 of the
2 '759 Patent.

3 327. Each aspect of the functioning of the Accused MoCA Instrumentalities
4 described in the claim chart operates while deployed to customer premises in a
5 manner controlled and intended by DIRECTV.

6 328. DIRECTV provides no software, support or other facility to customers
7 to modify any aspect of the functioning described in the claim chart of the Accused
8 MoCA Instrumentalities while deployed to customer premises.

9 329. The Accused MoCA Instrumentalities are compliant with MoCA 1.0,
10 1.1., and/or 2.0, as described in the '759 Patent claim chart, Exhibit F.

11 330. DIRECTV therefore directly infringes at least claim 2 of the '759 Patent
12 by using the Accused MoCA Instrumentalities to provide Accused Services to
13 customers.

14 331. DIRECTV sells the Accused Services to its customers and subscribers
15 for a fee. Pursuant to the sale of these services, DIRECTV uses the method recited in
16 at least claim 2 of the '759 Patent to provide the Accused Services to DIRECTV's
17 customers and subscribers through the Accused MoCA Instrumentalities. DIRECTV
18 is therefore engaging in the infringing use of at least claim 2 of the '759 Patent in
19 order to generate revenue from its customers and subscribers.

20 332. DIRECTV directly infringes at least claim 2 of the '759 Patent when it,
21 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
22 otherwise provide Accused Services.

23 333. DIRECTV had knowledge of the '759 Patent no later than its receipt of
24 Entropic's communications sent to DIRECTV on March 9, 2022.

25 334. DIRECTV has been aware that it infringes the '759 Patent no later than
26 its receipt of Entropic's communications sent to DIRECTV on March 9, 2022.

27 335. DIRECTV has known of or has been willfully blind to the '759 Patent
28 since before the March 9, 2022 communications from Entropic.

1 336. The '759 Patent issued while or before DIRECTV was a member of
2 MoCA.

3 337. Because of DIRECTV's knowledge of Entropic Inc.'s work and
4 contributions related to MoCA technology, DIRECTV had knowledge of the '759
5 Patent before March 9, 2022 or was willfully blind to its existence.

6 338. DIRECTV has been aware of its infringement of the '759 Patent no later
7 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
8 infringement of the '759 Patent by MoCA technology, which is deployed by
9 DIRECTV. The claim charts DIRECTV received approximately three months before
10 the filing of this Complaint show that the claims of the '759 Patent are essential to
11 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

12 339. The claims of the '759 Patent are essential to practicing at least MoCA
13 standards versions 1.0, 1.1, and/or 2.0.

14 340. DIRECTV knew, or was willfully blind to the fact that the technology
15 of the '759 Patent directly relates to networking over coaxial cable, including MoCA,
16 at least as early as DIRECTV became aware of the existence of the '759 Patent.
17 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
18 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
19 instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver DIRECTV
20 services would necessarily infringe one or more claims of the '759 Patent.

21 341. Since learning of the '759 Patent and its infringing activities, DIRECTV
22 has failed to cease its infringing activities.

23 342. DIRECTV's customers and subscribers directly infringe at least claim 2
24 of the '759 Patent by using the Accused MoCA Instrumentalities in connection with
25 the Accused Services provided by DIRECTV.

26 343. DIRECTV actively induces its customers' and subscribers' direct
27 infringement by providing the Accused Services and associated support.

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1 344. For example, DIRECTV actively induces infringement of at least claim
2 of the '759 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
3 customers with specific instructions and/or assistance (including installation and
4 maintenance) regarding the instantiation of a MoCA network and the use of the
5 Accused MoCA Instrumentalities to infringe the '759 Patent.

6 345. DIRECTV aids, instructs, supports, and otherwise acts with the intent
7 to cause an end user to make and/or use the MoCA network and/or use the Accused
8 MoCA Instrumentalities to infringe every element of at least claim 2 of the '759
9 Patent.

10 346. Additionally, DIRECTV contributes to the customers' and subscribers'
11 direct infringement. DIRECTV provides at least the Accused MoCA
12 Instrumentalities that create and are at least substantially all of a MoCA network to
13 be used to infringe at least claim 2 of the '759 Patent.

14 347. The Accused MoCA Instrumentalities have no substantial noninfringing
15 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
16 the Accused Services provided by DIRECTV, the end user necessarily directly
17 infringes at least claim 2 of the '759 Patent. The Accused MoCA Instrumentalities
18 are therefore especially made or especially adapted for use in an infringing manner.

19 348. DIRECTV's inducement of, and contribution to, the direct infringement
20 of at least claim 2 of the '759 Patent has been, and is, continuous and ongoing through
21 the acts described above in connection with DIRECTV's provision of the Accused
22 Services.

23 349. DIRECTV's infringement of the '759 Patent is, has been, and continues
24 to be willful, intentional, deliberate, and/or in conscious disregard for Entropic's
25 rights under the patent.

26 350. Entropic has been damaged as a result of the infringing conduct alleged
27 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
28

1 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
2 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

3 351. Upon information and belief, there is no duty to mark any
4 instrumentality with the '759 Patent in accordance with 35 U.S.C. § 287.

5 **COUNT IV**

6 **(Infringement of the '802 Patent)**

7 352. Entropic incorporates by reference each allegation of Paragraphs 1
8 through 179.

9 353. The '802 Patent duly issued on December 27, 2011 from an application
10 filed December 2, 2005 and a provisional application filed December 2, 2004.

11 354. Entropic owns all substantial rights, interest, and title in and to the '802
12 Patent, including the sole and exclusive right to prosecute this action and enforce the
13 '802 Patent against infringers, and to collect damages for all relevant times.

14 355. The '802 Patent is generally directed to, *inter alia*, broadband cable
15 networks that allow devices to communicate directly over the existing coaxial cable
16 with its current architecture without the need to modify the existing cable
17 infrastructure. Each device communicates with the other devices in the network and
18 establishes the best modulation and other transmission parameters that is optimized
19 and periodically adapted to the channel between each pair of devices. '802 Patent,
20 col. 4, lines 7–24. The '802 Patent has four claims, all of which are independent. At
21 least these claims of the '802 Patent are directed to a variety of techniques for
22 establishing a modulation scheme for communications between nodes in the MoCA
23 network. A true and accurate copy of the '802 Patent is attached hereto as Exhibit G.

24 356. The '802 Patent is directed to patent-eligible subject matter pursuant to
25 35 U.S.C. § 101.

26 357. The '802 Patent is valid and enforceable, and presumed as such,
27 pursuant to 35 U.S.C. § 282.

28 ///

1 358. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
2 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
3 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
4 DIRECTV HS17) in connection with operating and providing the Accused Services.

5 359. The Accused MoCA Instrumentalities deployed by DIRECTV to
6 customer premises remain the property of DIRECTV while deployed.

7 360. The Accused MoCA Instrumentalities operate while deployed in a
8 manner controlled and intended by DIRECTV.

9 361. As set forth in the attached non-limiting claim chart (Exhibit H), any
10 product or system operating in a MoCA network compliant with the charted
11 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 3 of the
12 '802 Patent.

13 362. Each aspect of the functioning of the Accused MoCA Instrumentalities
14 described in the claim chart operates while deployed to customer premises in a
15 manner controlled and intended by DIRECTV.

16 363. DIRECTV provides no software, support or other facility to customers
17 to modify any aspect of the functioning described in the claim chart of the Accused
18 MoCA Instrumentalities while deployed to customer premises.

19 364. The Accused MoCA Instrumentalities are compliant with MoCA 1.0,
20 1.1., and/or 2.0, as described in the '802 Patent claim chart, Exhibit H.

21 365. DIRECTV therefore directly infringes at least claim 3 of the '802 Patent
22 by using the Accused MoCA Instrumentalities to provide Accused Services to
23 customers.

24 366. DIRECTV sells the Accused Services to its customers and subscribers
25 for a fee. Pursuant to the sale of these services, DIRECTV uses the method recited in
26 at least claim 3 of the '802 Patent to provide the Accused Services to DIRECTV's
27 customers and subscribers through the Accused MoCA Instrumentalities. DIRECTV
28

1 is therefore engaging in the infringing use of at least claim 3 of the '802 Patent in
2 order to generate revenue from its customers and subscribers.

3 367. DIRECTV directly infringes at least claim 3 of the '802 Patent when it,
4 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
5 otherwise provide Accused Services and/or the Accused MoCA Instrumentalities.

6 368. DIRECTV had knowledge of the '802 Patent no later than its receipt of
7 Entropic's communications sent to DIRECTV on March 9, 2022.

8 369. DIRECTV has been aware that it infringes the '802 Patent no later than
9 its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

10 370. DIRECTV has known of or has been willfully blind to the '802 Patent
11 since before the March 9, 2022 communications from Entropic.

12 371. The '802 Patent issued while or before DIRECTV was a member of
13 MoCA.

14 372. Because of DIRECTV's knowledge of Entropic Inc.'s work and
15 contributions related to MoCA technology, DIRECTV had knowledge of the '802
16 Patent before March 9, 2022 or was willfully blind to its existence.

17 373. DIRECTV has been aware of its infringement of the '802 Patent no later
18 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
19 infringement of the '802 Patent by MoCA technology, which is deployed by
20 DIRECTV. The claim charts DIRECTV received approximately three months before
21 the filing of this Complaint show that the claims of the '802 Patent are essential to
22 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

23 374. The claims of the '802 Patent are essential to practicing at least MoCA
24 standards versions 1.0, 1.1, and/or 2.0.

25 375. DIRECTV knew, or was willfully blind to the fact that the technology
26 of the '802 Patent directly relates to networking over coaxial cable, including MoCA,
27 at least as early as DIRECTV became aware of the existence of the '802 Patent.
28 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,

1 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
2 instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver DIRECTV
3 services would necessarily infringe one or more claims of the '802 Patent.

4 376. Since learning of the '802 Patent and its infringing activities, DIRECTV
5 has failed to cease its infringing activities.

6 377. DIRECTV's customers and subscribers directly infringe at least claim 3
7 of the '802 Patent by using the Accused MoCA Instrumentalities in connection with
8 the Accused Services provided by DIRECTV.

9 378. DIRECTV actively induces its customers' and subscribers' direct
10 infringement by providing the Accused Services and associated support.

11 379. For example, DIRECTV actively induces infringement of at least claim
12 3 of the '802 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
13 customers with specific instructions and/or assistance (including installation and
14 maintenance) regarding the instantiation of a MoCA network and the use of the
15 Accused MoCA Instrumentalities to infringe the '802 Patent.

16 380. DIRECTV aids, instructs, supports, and otherwise acts with the intent
17 to cause an end user to make and/or use the MoCA network and/or use the Accused
18 MoCA Instrumentalities to infringe every element of at least claim 3 of the '802
19 Patent.

20 381. Additionally, DIRECTV contributes to the customers' and subscribers'
21 direct infringement. DIRECTV provides at least the Accused MoCA
22 Instrumentalities that create and are at least substantially all of a MoCA network to
23 be used to infringe at least claim 3 of the '802 Patent.

24 382. The Accused MoCA Instrumentalities have no substantial noninfringing
25 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
26 the Accused Services provided by DIRECTV, the end user necessarily directly
27 infringes at least claim 3 of the '802 Patent. The Accused MoCA Instrumentalities
28 are therefore especially made or especially adapted for use in an infringing manner.

1 Patent, col. 4, lines 12-28. The '450 Patent has 38 claims, of which, claim 1, 8, 27,
2 29, and 34 are independent. At least these claims of the '450 Patent are directed to a
3 variety of techniques for determining a common modulation scheme for
4 communications between nodes in the MoCA network. A true and accurate copy of
5 the '450 Patent is attached hereto as Exhibit I.

6 391. The '450 Patent is directed to patent-eligible subject matter pursuant to
7 35 U.S.C. § 101.

8 392. The '450 Patent is valid and enforceable, and presumed as such,
9 pursuant to 35 U.S.C. § 282.

10 393. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
11 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
12 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
13 DIRECTV HS17) in connection with operating and providing the Accused Services.

14 394. The Accused MoCA Instrumentalities deployed by DIRECTV to
15 customer premises remain the property of DIRECTV while deployed.

16 395. The Accused MoCA Instrumentalities operate while deployed in a
17 manner controlled and intended by DIRECTV.

18 396. As set forth in the attached non-limiting claim chart (Exhibit J), any
19 product or system operating in a MoCA network compliant with the charted
20 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 29 of the
21 '450 Patent.

22 397. Each aspect of the functioning of the Accused MoCA Instrumentalities
23 described in the claim chart operates while deployed to customer premises in a
24 manner controlled and intended by DIRECTV.

25 398. DIRECTV provides no software, support or other facility to customers
26 to modify any aspect of the functioning described in the claim chart of the Accused
27 MoCA Instrumentalities while deployed to customer premises.

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1 399. The Accused MoCA Instrumentalities are compliant with MoCA 1.0,
2 1.1., and/or 2.0, as described in the '450 Patent claim chart, Exhibit J.

3 400. DIRECTV therefore directly infringes at least claim 29 of the '450
4 Patent by using the Accused MoCA Instrumentalities to provide Accused Services to
5 customers.

6 401. DIRECTV sells the Accused Services to its customers and subscribers
7 for a fee. Pursuant to the sale of these services, DIRECTV uses the method recited in
8 at least claim 29 of the '450 Patent to provide the Accused Services to DIRECTV's
9 customers and subscribers through the Accused MoCA Instrumentalities. DIRECTV
10 is therefore engaging in the infringing use of at least claim 29 of the '450 Patent in
11 order to generate revenue from its customers and subscribers.

12 402. DIRECTV directly infringes at least claim 29 of the '450 Patent when
13 it, for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
14 otherwise provide Accused Services.

15 403. DIRECTV had knowledge of the '450 Patent no later than its receipt of
16 Entropic's communications sent to DIRECTV on March 9, 2022.

17 404. DIRECTV has been aware that it infringes the '450 Patent no later than
18 its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

19 405. DIRECTV has known of or has been willfully blind to the '450 Patent
20 since before the March 9, 2022 communications from Entropic.

21 406. The '450 Patent issued while or before DIRECTV was a member of
22 MoCA.

23 407. Because of DIRECTV's knowledge of Entropic Inc.'s work and
24 contributions related to MoCA technology, DIRECTV had knowledge of the '450
25 Patent before March 9, 2022 or was willfully blind to its existence.

26 408. DIRECTV has been aware of its infringement of the '450 Patent no later
27 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
28 infringement of the '450 Patent by MoCA technology, which is deployed by

1 DIRECTV. The claim charts DIRECTV received approximately three months before
2 the filing of this Complaint show that the claims of the '450 Patent are essential to
3 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

4 409. The claims of the '450 Patent are essential to practicing at least MoCA
5 standards versions 1.0, 1.1, and/or 2.0.

6 410. DIRECTV knew, or was willfully blind to the fact that the technology
7 of the '450 Patent directly relates to networking over coaxial cable, including MoCA,
8 at least as early as DIRECTV became aware of the existence of the '450 Patent.
9 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
10 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
11 instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver DIRECTV
12 services would necessarily infringe one or more claims of the '450 Patent.

13 411. Since learning of the '450 Patent and its infringing activities, DIRECTV
14 has failed to cease its infringing activities.

15 412. DIRECTV's customers and subscribers directly infringe at least claim
16 29 of the '450 Patent by using the Accused MoCA Instrumentalities in connection
17 with the Accused Services provided by DIRECTV.

18 413. DIRECTV actively induces its customers' and subscribers' direct
19 infringement by providing the Accused Services and associated support.

20 414. For example, DIRECTV actively induces infringement of at least claim
21 29 of the '450 Patent by providing the Accused MoCA Instrumentalities to
22 DIRECTV customers with specific instructions and/or assistance (including
23 installation and maintenance) regarding the instantiation of a MoCA network and the
24 use of the Accused MoCA Instrumentalities to infringe the '450 Patent.

25 415. DIRECTV aids, instructs, supports, and otherwise acts with the intent
26 to cause an end user to make and/or use the MoCA network and/or use the Accused
27 MoCA Instrumentalities to infringe every element of at least claim 29 of the '450
28 Patent.

1 416. Additionally, DIRECTV contributes to the customers' and subscribers'
2 direct infringement. DIRECTV provides at least the Accused MoCA
3 Instrumentalities that create and are at least substantially all of a MoCA network to
4 be used to infringe at least claim 29 of the '450 Patent.

5 417. The Accused MoCA Instrumentalities have no substantial noninfringing
6 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
7 the Accused Services provided by DIRECTV, the end user directly infringes at least
8 claim 29 of the '450 Patent. The Accused MoCA Instrumentalities are especially
9 made or especially adapted for use in an infringing manner.

10 418. DIRECTV's inducement of, and contribution to, the direct infringement
11 of at least claim 29 of the '450 Patent has been, and is, continuous and ongoing
12 through the acts described above in connection with DIRECTV's provision of the
13 Accused Services.

14 419. DIRECTV's infringement of the '450 Patent is, has been, and continues
15 to be willful, intentional, deliberate, and/or in conscious disregard for Entropic's
16 rights under the patent.

17 420. Entropic has been damaged as a result of the infringing conduct alleged
18 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
19 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
20 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

21 421. Upon information and belief, there is no duty to mark any
22 instrumentality with the '450 Patent in accordance with 35 U.S.C. § 287.

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COUNT VI

(Infringement of the '7,566 Patent)⁵

422. Entropic incorporates by reference each allegation of Paragraphs 1 through 249.

423. The '7,566 Patent duly issued on April 9, 2019 from an application filed February 7, 2017 and an application filed September 19, 2005, and *inter alia*, a provisional application filed December 2, 2004.

424. Entropic owns all substantial rights, interest, and title in and to the '7,566 Patent, including the sole and exclusive right to prosecute this action and enforce the '7,566 Patent against infringers, and to collect damages for all relevant times.

425. The '7,566 Patent uses the claimed controller to form, manage, and optimize mesh networks over coaxial cable, thereby allowing nodes to communicate efficiently with each other. *Id.* at col. 3, lines 21-24; col. 4, lines 22-42. This invention resulted in creating the ability for set top boxes to communicate with one another over coaxial cable networks. '7,566 Patent, col. 3, lines 39-46. The '7,566 Patent is generally directed to, *inter alia*, broadband cable networks that allow devices to communicate directly over the existing coaxial cable with its current architecture without the need to modify the existing cable infrastructure. Each device communicates with the other devices in the network and establishes the best modulation and other transmission parameters that is optimized and periodically adapted to the channel between each pair of devices. '7,566 Patent, col. 4, lines 23–39. The '7,566 Patent has 20 claims, of which claims 1, 11, and 19 are independent. At least these claims of the '7,566 Patent are directed to a variety of techniques for

⁵ The parties are discussing how they intend to proceed with respect to the '7,566 Patent. Entropic has included these allegations from the Original Complaint pending the result of those discussions.

1 controlling the admission of nodes in the MoCA network. A true and accurate copy
2 of the '7,566 Patent is attached hereto as Exhibit K.

3 426. The '7,566 Patent is directed to patent-eligible subject matter pursuant
4 to 35 U.S.C. § 101.

5 427. The '7,566 Patent is valid and enforceable, and presumed as such,
6 pursuant to 35 U.S.C. § 282.

7 428. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
8 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
9 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
10 DIRECTV HS17) in connection with operating and providing the Accused Services.

11 429. The Accused MoCA Instrumentalities deployed by DIRECTV to
12 customer premises remain the property of DIRECTV while deployed.

13 430. The Accused MoCA Instrumentalities operate while deployed in a
14 manner controlled and intended by DIRECTV.

15 431. As set forth in the attached non-limiting claim chart (Exhibit L), any
16 product or system operating in a MoCA network compliant with the charted
17 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 11 of the
18 '7,566 Patent.

19 432. Each aspect of the functioning of the Accused MoCA Instrumentalities
20 described in the claim chart operates while deployed to customer premises in a
21 manner controlled and intended by DIRECTV.

22 433. DIRECTV provides no software, support or other facility to customers
23 to modify any aspect of the functioning described in the claim chart of the Accused
24 MoCA Instrumentalities while deployed to customer premises.

25 434. The Accused MoCA Instrumentalities are compliant with MoCA 1.0,
26 1.1., and/or 2.0, as described in the '7,566 Patent claim chart, Exhibit L.

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1 435. DIRECTV therefore directly infringes at least claim 11 of the '7,566
2 Patent by using the Accused MoCA Instrumentalities to provide Accused Services to
3 customers.

4 436. DIRECTV directly infringes at least claim 11 of the '7,566 Patent when
5 it, for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
6 otherwise provide Accused Services and/or the Accused MoCA Instrumentalities.

7 437. DIRECTV directly infringes at least claim 11 of the '7,566 Patent by
8 making, importing, selling, and/or offering for sale the Accused MoCA
9 Instrumentalities, which meet every element of at least claim 11 of the '7,566 Patent,
10 in connection with providing the Accused Services over an on-premises coaxial cable
11 network.

12 438. DIRECTV had knowledge of the '7,566 Patent no later than its receipt
13 of Entropic's communications sent to DIRECTV on March 9, 2022.

14 439. DIRECTV has been aware that it infringes the '7,566 Patent no later
15 than its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

16 440. DIRECTV has known of or has been willfully blind to the '7,566 Patent
17 since before the March 9, 2022 communications from Entropic.

18 441. The '7,566 Patent issued while or before DIRECTV was a member of
19 MoCA.

20 442. Because of DIRECTV's knowledge of Entropic Inc.'s work and
21 contributions related to MoCA technology, DIRECTV had knowledge of the '7,566
22 Patent before March 9, 2022 or was willfully blind to its existence.

23 443. DIRECTV has been aware of its infringement of the '7,566 Patent no
24 later than February 17, 2023 when Entropic sent DIRECTV claim charts detailing
25 the infringement of the '7,566 Patent by MoCA technology, which is deployed by
26 DIRECTV. The claim charts DIRECTV received approximately three months before
27 the filing of this Complaint show that the claims of the '7,566 Patent are essential to
28 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

1 444. The claims of the '7,566 Patent are essential to practicing at least MoCA
2 standards versions 1.0, 1.1, and/or 2.0.

3 445. DIRECTV knew, or was willfully blind to the fact that the technology
4 of the '7,566 Patent directly relates to networking over coaxial cable, including
5 MoCA, at least as early as DIRECTV became aware of the existence of the '7,566
6 Patent. Because of its familiarity with, and access to, the MoCA standards,
7 DIRECTV knew, or was willfully blind to the fact, that use (by DIRECTV or its
8 customers) of instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver
9 DIRECTV services would necessarily infringe one or more claims of the '7,566
10 Patent.

11 446. Since learning of the '7,566 Patent and its infringing activities,
12 DIRECTV has failed to cease its infringing activities.

13 447. DIRECTV's customers and subscribers directly infringe at least claim
14 11 of the '7,566 Patent by using the Accused MoCA Instrumentalities in connection
15 with the Accused Services provided by DIRECTV.

16 448. DIRECTV actively induces its customers' and subscribers' direct
17 infringement by providing the Accused Services through the Accused MoCA
18 Instrumentalities, and associated support.

19 449. For example, DIRECTV actively induces infringement of at least claim
20 11 of the '7,566 Patent by providing the Accused MoCA Instrumentalities to
21 DIRECTV customers with specific instructions and/or assistance (including
22 installation and maintenance) regarding the instantiation of a MoCA network and the
23 use of the Accused MoCA Instrumentalities to infringe the '7,566 Patent.

24 450. DIRECTV aids, instructs, supports, and otherwise acts with the intent
25 to cause an end user to make and/or use the MoCA network and/or use the Accused
26 MoCA Instrumentalities to infringe every element of at least claim 11 of the '7,566
27 Patent.

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1 458. The '539 Patent duly issued on December 31, 2013 from an application
2 filed September 29, 2005 and, *inter alia*, a provisional application filed December 2,
3 2004.

4 459. Entropic owns all substantial rights, interest, and title in and to the '539
5 Patent, including the sole and exclusive right to prosecute this action and enforce the
6 '539 Patent against infringers, and to collect damages for all relevant times.

7 460. The '539 Patent is generally directed to, *inter alia*, a physical layer
8 transmitter that performs all of the necessary RF, analog and digital processing
9 required for transmitting MAC messages between devices in a broadband cable
10 network. '539 Patent, col. 4, lines 37–48. The '539 Patent has seven claims, of which
11 claim 1 is independent. At least this claim of the '539 Patent is directed at a variety
12 of techniques for monitoring and maintaining utilized modulation profiles in the
13 MoCA network. A true and accurate copy of the '539 Patent is attached hereto as
14 Exhibit M.

15 461. The '539 Patent is directed to patent-eligible subject matter pursuant to
16 35 U.S.C. § 101.

17 462. The '539 Patent is valid and enforceable, and presumed as such,
18 pursuant to 35 U.S.C. § 282.

19 463. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
20 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
21 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
22 DIRECTV HS17) in connection with operating and providing the Accused Services.

23 464. The Accused MoCA Instrumentalities deployed by DIRECTV to
24 customer premises remain the property of DIRECTV while deployed.

25 465. The Accused MoCA Instrumentalities operate while deployed in a
26 manner controlled and intended by DIRECTV.

27 466. As set forth in the attached non-limiting claim chart (Exhibit N), any
28 product or system operating in a MoCA network compliant with the charted

1 provisions of MoCA 1.0, 1.1, and/or 2.0 necessarily infringes at least claim 1 of the
2 '539 Patent.

3 467. Each aspect of the functioning of the Accused MoCA Instrumentalities
4 described in the claim chart operates while deployed to customer premises in a
5 manner controlled and intended by DIRECTV.

6 468. DIRECTV provides no software, support or other facility to customers
7 to modify any aspect of the functioning described in the claim chart of the Accused
8 MoCA Instrumentalities while deployed to customer premises.

9 469. The Accused MoCA Instrumentalities are compliant with MoCA 1.0,
10 1.1., and/or MoCA 2.0, as described in the '539 Patent claim chart, Exhibit N.

11 470. DIRECTV therefore directly infringes at least claim 1 of the '539 Patent
12 by using the Accused MoCA Instrumentalities to provide Accused Services to
13 customers.

14 471. DIRECTV directly infringes at least claim 1 of the '539 Patent when it,
15 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
16 otherwise provide Accused Services.

17 472. DIRECTV directly infringes at least claim 1 of the '539 Patent by
18 making, importing, selling, and/or offering for sale the Accused MoCA
19 Instrumentalities, which meet every element of at least claim 1 of the '539 Patent, in
20 connection with providing the Accused Services over an on-premises coaxial cable
21 network.

22 473. DIRECTV had knowledge of the '539 Patent no later than its receipt of
23 Entropic's communications sent to DIRECTV on March 9, 2022.

24 474. DIRECTV has been aware that it infringes the '539 Patent no later than
25 its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

26 475. DIRECTV has known of or has been willfully blind to the '539 Patent
27 since before the March 9, 2022 communications from Entropic.

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1 476. The '539 Patent issued while or before DIRECTV was a member of
2 MoCA.

3 477. Because of DIRECTV's knowledge of Entropic Inc.'s work and
4 contributions related to MoCA technology, DIRECTV had knowledge of the '539
5 Patent before March 9, 2022 or was willfully blind to its existence.

6 478. DIRECTV has been aware of its infringement of the '539 Patent no later
7 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
8 infringement of the '539 Patent by MoCA technology, which is deployed by
9 DIRECTV. The claim charts DIRECTV received approximately three months before
10 the filing of this Complaint show that the claims of the '539 Patent are essential to
11 practicing at least MoCA standards versions 1.0, 1.1, and/or 2.0.

12 479. The claims of the '539 Patent are essential to practicing at least MoCA
13 standards versions 1.0, 1.1, and/or 2.0.

14 480. DIRECTV knew, or was willfully blind to the fact that the technology
15 of the '539 Patent directly relates to networking over coaxial cable, including MoCA,
16 at least as early as DIRECTV became aware of the existence of the '539 Patent.
17 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
18 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
19 instrumentalities compliant with MoCA 1.0, 1.1, and/or 2.0 to deliver DIRECTV
20 services would necessarily infringe one or more claims of the '539 Patent.

21 481. Since learning of the '539 Patent and its infringing activities, DIRECTV
22 has failed to cease its infringing activities.

23 482. DIRECTV's customers and subscribers directly infringe at least claim 1
24 of the '539 Patent by using the Accused MoCA Instrumentalities in connection with
25 the Accused Services provided by DIRECTV.

26 483. DIRECTV actively induces its customers' and subscribers' direct
27 infringement by providing the Accused Services through the Accused MoCA
28 Instrumentalities, and associated support.

1 484. For example, DIRECTV actively induces infringement of at least claim
2 1 of the '539 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
3 customers with specific instructions and/or assistance (including installation and
4 maintenance) regarding the instantiation of a MoCA network and the use of the
5 Accused MoCA Instrumentalities to infringe the '539 Patent.

6 485. DIRECTV aids, instructs, supports, and otherwise acts with the intent
7 to cause an end user to make and/or use the MoCA network and/or use the Accused
8 MoCA Instrumentalities to infringe every element of at least claim 1 of the '539
9 Patent.

10 486. Additionally, DIRECTV contributes to the customers' and subscribers'
11 direct infringement. DIRECTV provides, *inter alia*, the Accused MoCA
12 Instrumentalities designed and configured to create a MoCA network and operate as
13 nodes in the network, the use of which infringes at least claim 1 of the '539 Patent.

14 487. The Accused MoCA Instrumentalities have no substantial noninfringing
15 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
16 the Accused Services provided by DIRECTV, the end user directly infringes at least
17 claim 1 of the '539 Patent. The Accused MoCA Instrumentalities are therefore
18 especially made or especially adapted for use in an infringing manner.

19 488. DIRECTV's inducement of, and contribution to, the direct infringement
20 of at least claim 1 of the '539 Patent has been, and is, continuous and ongoing through
21 the acts described above in connection with DIRECTV's provision of the Accused
22 Services.

23 489. DIRECTV's infringement of the '539 Patent is, has been, and continues
24 to be willful, intentional, deliberate, and/or in conscious disregard for Entropic's
25 rights under the patent.

26 490. Entropic has been damaged as a result of the infringing conduct alleged
27 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
28

1 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
2 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

3 491. Entropic is aware of no obligation to mark any instrumentality with the
4 '539 Patent in accordance with 35 U.S.C. § 287.

5 **COUNT VIII**

6 **(Infringement of the '213 Patent)**

7 492. Entropic incorporates by reference each allegation of Paragraphs 1
8 through 319.

9 493. The '213 Patent duly issued on December 5, 2017 from an application
10 filed February 6, 2008, and, *inter alia*, a provisional application filed on February 6
11 2007.

12 494. Entropic owns all substantial rights, interest, and title in and to the '213
13 Patent, including the sole and exclusive right to prosecute this action and enforce the
14 '213 Patent against infringers, and to collect damages for all relevant times.

15 495. The '213 Patent is generally directed to, *inter alia*, low-cost and high-
16 speed management of resources within a network in order to secure the capability to
17 distribute multimedia data (such as video/audio, games, images, generic data, and
18 interactive services) between devices within existing on-premises coaxial cable
19 networks. '213 Patent, col. 3, lines 46–53. The '213 Patent has 24 claims, of which
20 claims 1, 13, and 23 are independent. At least these claims of the '213 Patent are
21 directed to a variety of techniques for allocating resources for guaranteed quality of
22 service flows in the MoCA network. A true and accurate copy of the '213 Patent is
23 attached hereto as Exhibit O.

24 496. The '213 Patent is directed to patent-eligible subject matter pursuant to
25 35 U.S.C. § 101.

26 497. The '213 Patent is valid and enforceable, and presumed as such,
27 pursuant to 35 U.S.C. § 282.

28 ///

1 498. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
2 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
3 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
4 DIRECTV HS17) in connection with operating and providing the Accused Services.

5 499. The Accused MoCA Instrumentalities deployed by DIRECTV to
6 customer premises remain the property of DIRECTV while deployed.

7 500. The Accused MoCA Instrumentalities operate while deployed in a
8 manner controlled and intended by DIRECTV.

9 501. As set forth in the attached non-limiting claim chart (Exhibit P), any
10 product or system operating in a MoCA network compliant with the charted
11 provisions of MoCA 1.1, or 2.0 necessarily infringes at least claim 1 of the '213
12 Patent.

13 502. Each aspect of the functioning of the Accused MoCA Instrumentalities
14 described in the claim chart operates while deployed to customer premises in a
15 manner controlled and intended by DIRECTV.

16 503. DIRECTV provides no software, support or other facility to customers
17 to modify any aspect of the functioning described in the claim chart of the Accused
18 MoCA Instrumentalities while deployed to customer premises.

19 504. The Accused MoCA Instrumentalities are compliant with MoCA 1.1
20 and/or MoCA 2.0, as described in the '213 Patent claim chart, Exhibit P.

21 505. DIRECTV therefore directly infringes at least claim 1 of the '213 Patent
22 by using the Accused MoCA Instrumentalities to provide Accused Services to
23 customers.

24 506. DIRECTV sells the Accused Services to its customers and subscribers
25 for a fee. Pursuant to the sale of these services, DIRECTV uses the method recited in
26 at least claim 1 of the '213 Patent to provide the Accused Services to DIRECTV's
27 customers and subscribers through the Accused MoCA Instrumentalities. DIRECTV
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1 is therefore engaging in the infringing use of at least claim 1 of the '213 Patent in
2 order to generate revenue from its customers and subscribers.

3 507. DIRECTV directly infringes at least claim 1 of the '213 Patent when it,
4 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
5 otherwise provide Accused Services.

6 508. DIRECTV had knowledge of the '213 Patent no later than its receipt of
7 Entropic's communications sent to DIRECTV on March 9, 2022.

8 509. DIRECTV has been aware that it infringes the '213 Patent no later than
9 its receipt of Entropic's communications sent to DIRECTV on March 9, 2022.

10 510. DIRECTV has known of or has been willfully blind to the '213 Patent
11 since before the March 9, 2022 communications from Entropic.

12 511. The '213 Patent issued while or before DIRECTV was a member of
13 MoCA.

14 512. Because of DIRECTV's knowledge of Entropic Inc.'s work and
15 contributions related to MoCA technology, DIRECTV had knowledge of the '213
16 Patent before March 9, 2022 or was willfully blind to its existence.

17 513. DIRECTV has been aware of its infringement of the '213 Patent no later
18 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
19 infringement of the '213 Patent by MoCA technology, which is deployed by
20 DIRECTV. The claim charts DIRECTV received approximately three months before
21 the filing of this Complaint show that the claims of the '213 Patent are essential to
22 practicing at least MoCA standards versions 1.1, and/or 2.0.

23 514. The claims of the '213 Patent are essential to practicing at least MoCA
24 standards versions 1.1, and/or 2.0.

25 515. DIRECTV knew, or was willfully blind to the fact that the technology
26 of the '213 Patent directly relates to networking over coaxial cable, including MoCA,
27 at least as early as DIRECTV became aware of the existence of the '213 Patent.
28 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,

1 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
2 instrumentalities compliant with MoCA 1.1, and/or 2.0 to deliver DIRECTV services
3 would necessarily infringe one or more claims of the '213 Patent.

4 516. Since learning of the '213 Patent and its infringing activities, DIRECTV
5 has failed to cease its infringing activities.

6 517. DIRECTV's customers and subscribers directly infringe at least claim 1
7 of the '213 Patent by using the Accused MoCA Instrumentalities in connection with
8 the Accused Services provided by DIRECTV.

9 518. DIRECTV actively induces its customers' and subscribers' direct
10 infringement by providing the Accused Services and associated support.

11 519. For example, DIRECTV actively induces infringement of at least claim
12 1 of the '213 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
13 customers with specific instructions and/or assistance (including installation and
14 maintenance) regarding the instantiation of a MoCA network and the use of the
15 Accused MoCA Instrumentalities to infringe the '213 Patent.

16 520. DIRECTV aids, instructs, supports, and otherwise acts with the intent
17 to cause an end user to make and/or use the MoCA network and/or use the Accused
18 MoCA Instrumentalities to infringe every element of at least claim 1 of the '213
19 Patent.

20 521. Additionally, DIRECTV contributes to the customers' and subscribers'
21 direct infringement. DIRECTV provides at least the Accused MoCA
22 Instrumentalities that create and are at least substantially all of a MoCA network to
23 be used to infringe at least claim 1 of the '213 Patent.

24 522. The Accused MoCA Instrumentalities have no substantial noninfringing
25 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
26 the Accused Services provided by DIRECTV, the end user directly infringes at least
27 claim 1 of the '213 Patent. The Accused MoCA Instrumentalities are therefore
28 especially made or especially adapted for use in an infringing manner.

1 claims 1, 5, 12–17 are independent. At least these claims of the '422 Patent are
2 directed to a variety of techniques for allocating resources for guaranteed quality of
3 service flows in the MoCA network. A true and accurate copy of the '422 Patent is
4 attached hereto as Exhibit Q.

5 531. The '422 Patent is directed to patent-eligible subject matter pursuant to
6 35 U.S.C. § 101.

7 532. The '422 Patent is valid and enforceable, and presumed as such,
8 pursuant to 35 U.S.C. § 282.

9 533. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
10 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
11 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
12 DIRECTV HS17) in connection with operating and providing the Accused Services.

13 534. The Accused MoCA Instrumentalities deployed by DIRECTV to
14 customer premises remain the property of DIRECTV while deployed.

15 535. The Accused MoCA Instrumentalities operate while deployed in a
16 manner controlled and intended by DIRECTV.

17 536. As set forth in the attached non-limiting claim chart (Exhibit R), any
18 product or system operating in a MoCA network compliant with the charted
19 provisions of MoCA 1.1, or 2.0 necessarily infringes at least claim 1 of the '422
20 Patent.

21 537. Each aspect of the functioning of the Accused MoCA Instrumentalities
22 described in the claim chart operates while deployed to customer premises in a
23 manner controlled and intended by DIRECTV.

24 538. DIRECTV provides no software, support or other facility to customers
25 to modify any aspect of the functioning described in the claim chart of the Accused
26 MoCA Instrumentalities while deployed to customer premises.

27 539. The Accused MoCA Instrumentalities are compliant with MoCA 1.1
28 and/or MoCA 2.0, as described in the '422 Patent claim chart, Exhibit R.

1 540. DIRECTV therefore directly infringes at least claim 1 of the '422 Patent
2 by using the Accused MoCA Instrumentalities to provide Accused Services to
3 customers.

4 541. DIRECTV directly infringes at least claim 1 of the '422 Patent when it,
5 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
6 otherwise provide Accused Services.

7 542. DIRECTV directly infringes at least claim 1 of the '422 Patent by
8 making, importing, selling, and/or offering for sale the Accused MoCA
9 Instrumentalities in connection with providing the Accused Services over an
10 on-premises coaxial cable network, which meets every element of at least claim 1 of
11 the '422 Patent.

12 543. DIRECTV had knowledge of the '422 Patent no later than its receipt of
13 Entropic's communications sent to DIRECTV on March 9, 2022.

14 544. DIRECTV has been aware that it infringes the '422 Patent no later than
15 its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

16 545. DIRECTV has known of or has been willfully blind to the '422 Patent
17 since before the March 9, 2022 communications from Entropic.

18 546. The '422 Patent issued while or before DIRECTV was a member of
19 MoCA.

20 547. Because of DIRECTV's knowledge of Entropic Inc.'s work and
21 contributions related to MoCA technology, DIRECTV had knowledge of the '422
22 Patent before March 9, 2022 or was willfully blind to its existence.

23 548. DIRECTV has been aware of its infringement of the '422 Patent no later
24 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
25 infringement of the '422 Patent by MoCA technology, which is deployed by
26 DIRECTV. The claim charts DIRECTV received approximately three months before
27 the filing of this Complaint show that the claims of the '422 Patent are essential to
28 practicing at least MoCA standards versions 1.1, and/or 2.0.

1 549. The claims of the '422 Patent are essential to practicing at least MoCA
2 standards versions 1.1, and/or 2.0.

3 550. DIRECTV knew, or was willfully blind to the fact that the technology
4 of the '422 Patent directly relates to networking over coaxial cable, including MoCA,
5 at least as early as DIRECTV became aware of the existence of the '422 Patent.
6 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
7 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
8 instrumentalities compliant with MoCA 1.1, and/or 2.0 to deliver DIRECTV services
9 would necessarily infringe one or more claims of the '422 Patent.

10 551. Since learning of the '422 Patent and its infringing activities, DIRECTV
11 has failed to cease its infringing activities.

12 552. DIRECTV's customers and subscribers directly infringe at least claim 1
13 of the '422 Patent by using the Accused MoCA Instrumentalities in connection with
14 the Accused Services provided by DIRECTV.

15 553. DIRECTV actively induces its customers' and subscribers' direct
16 infringement by providing the Accused Services and associated support.

17 554. For example, DIRECTV actively induces infringement of at least claim
18 1 of the '422 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
19 customers with specific instructions and/or assistance (including installation and
20 maintenance) regarding the instantiation of a MoCA network and the use of the
21 Accused MoCA Instrumentalities to infringe the '422 Patent.

22 555. DIRECTV aids, instructs, supports, and otherwise acts with the intent
23 to cause an end user to make and/or use the MoCA network and/or use the Accused
24 MoCA Instrumentalities to infringe every element of at least claim 1 of the '422
25 Patent.

26 556. Additionally, DIRECTV contributes to the customers' and subscribers'
27 direct infringement. DIRECTV provides at least the Accused MoCA
28

1 Instrumentalities that create and are at least substantially all of a MoCA network to
2 be used to infringe at least claim 1 of the '422 Patent.

3 557. The Accused MoCA Instrumentalities have no substantial noninfringing
4 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
5 the Accused Services provided by DIRECTV, the end user directly infringes at least
6 claim 1 of the '422 Patent. The Accused MoCA Instrumentalities are therefore
7 especially made or especially adapted for use in an infringing manner.

8 558. DIRECTV's inducement of, and contribution to, the direct infringement
9 of at least claim 1 of the '422 Patent has been, and is, continuous and ongoing through
10 the acts described above in connection with DIRECTV's provision of the Accused
11 Services.

12 559. DIRECTV's infringement of the '422 Patent is, has been, and continues
13 to be willful, intentional, deliberate, and/or in conscious disregard for Entropic's
14 rights under the patent.

15 560. Entropic has been damaged as a result of the infringing conduct alleged
16 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
17 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
18 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

19 561. Upon information and belief, there is no duty to mark any
20 instrumentality with the '422 Patent in accordance with 35 U.S.C. § 287.

21 **COUNT X**

22 **(Infringement of the '910 Patent)⁶**

23 562. Entropic incorporates by reference each allegation of Paragraphs 1
24 through 389.

25 ///

26 _____
27 ⁶ The parties are discussing how they intend to proceed with respect to the '910
28 Patent. Entropic has included these allegations from the Original Complaint
pending the result of those discussions.

1 563. The '910 Patent duly issued on July 24, 2012 from an application filed
2 May 9, 2008, and a provisional application filed May 9, 2007.

3 564. Entropic owns all substantial rights, interest, and title in and to the '910
4 Patent, including the sole and exclusive right to prosecute this action and enforce the
5 '910 Patent against infringers, and to collect damages for all relevant times.

6 565. The '910 Patent is the Packet Aggregation Patent, and it addresses the
7 problem in the prior art that "overhead admission is associated with each packet
8 transmitted through the network," and such information, "including identifiers,
9 source and destination addresses, error control fields, etc., is added to the user data
10 and reduces the availability of network bandwidth for user data." '910 Patent, col. 1,
11 lines 32-37. To address this problem the '910 Patent is generally directed to, *inter*
12 *alia*, transmitting data over a network, where the transmitting device aggregates
13 packets that are directed to a common destination node. This reduces the transmitted
14 packet overhead of the network by eliminating interframe gaps, preamble
15 information, and extra headers. '910 Patent, col. 1, line 66 – col. 2, line 3. The '910
16 Patent has three claims, all of which are independent. At least these claims of the
17 '910 Patent are directed to a variety of techniques for aggregating packet data units
18 in the MoCA network. A true and accurate copy of the '910 Patent is attached hereto
19 as Exhibit S.

20 566. The '910 Patent is directed to patent-eligible subject matter pursuant to
21 35 U.S.C. § 101.

22 567. The '910 Patent is valid and enforceable, and presumed as such,
23 pursuant to 35 U.S.C. § 282.

24 568. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
25 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
26 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
27 DIRECTV HS17) in connection with operating and providing the Accused Services.

28 ///

1 569. The Accused MoCA Instrumentalities deployed by DIRECTV to
2 customer premises remain the property of DIRECTV while deployed.

3 570. The Accused MoCA Instrumentalities operate while deployed in a
4 manner controlled and intended by DIRECTV.

5 571. As set forth in the attached non-limiting claim chart (Exhibit T), any
6 product or system operating in a MoCA network compliant with the charted
7 provisions of MoCA 1.1, or 2.0 necessarily infringes at least claim 3 of the '910
8 Patent.

9 572. Each aspect of the functioning of the Accused MoCA Instrumentalities
10 described in the claim chart operates while deployed to customer premises in a
11 manner controlled and intended by DIRECTV.

12 573. DIRECTV provides no software, support or other facility to customers
13 to modify any aspect of the functioning described in the claim chart of the Accused
14 MoCA Instrumentalities while deployed to customer premises.

15 574. The Accused MoCA Instrumentalities are compliant with MoCA 1.1.,
16 and/or MoCA 2.0, as described in the '910 Patent claim chart, Exhibit T.

17 575. DIRECTV therefore directly infringes at least claim 3 of the '910 Patent
18 by using the Accused MoCA Instrumentalities to provide Accused Services to
19 customers.

20 576. DIRECTV directly infringes at least claim 3 of the '910 Patent when it,
21 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
22 otherwise provide Accused Services.

23 577. DIRECTV directly infringes at least claim 3 of the '910 Patent by
24 making, importing, selling, and/or offering for sale the Accused MoCA
25 Instrumentalities, which meet every element of at least claim 3 of the '910 Patent, in
26 connection with providing the Accused Services over an on-premises coaxial cable
27 network.

28 ///

1 578. DIRECTV had knowledge of the '910 Patent no later than its receipt of
2 Entropic's communications sent to DIRECTV on March 9, 2022.

3 579. DIRECTV has been aware that it infringes the '910 Patent no later than
4 its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

5 580. DIRECTV has known of or has been willfully blind to the '910 Patent
6 since before the March 9, 2022 communications from Entropic.

7 581. The '910 Patent issued while or before DIRECTV was a member of
8 MoCA.

9 582. Because of DIRECTV's knowledge of Entropic Inc.'s work and
10 contributions related to MoCA technology, DIRECTV had knowledge of the '910
11 Patent before March 9, 2022 or was willfully blind to its existence.

12 583. DIRECTV has been aware of its infringement of the '910 Patent no later
13 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
14 infringement of the '910 Patent by MoCA technology, which is deployed by
15 DIRECTV. The claim charts DIRECTV received approximately three months before
16 the filing of this Complaint show that the claims of the '910 Patent are essential to
17 practicing at least MoCA standards versions 1.1, and/or 2.0.

18 584. The claims of the '910 Patent are essential to practicing at least MoCA
19 standards versions 1.1, and/or 2.0.

20 585. DIRECTV knew, or was willfully blind to the fact that the technology
21 of the '910 Patent directly relates to networking over coaxial cable, including MoCA,
22 at least as early as DIRECTV became aware of the existence of the '910 Patent.
23 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
24 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
25 instrumentalities compliant with MoCA 1.1, and/or 2.0 to deliver DIRECTV services
26 would necessarily infringe one or more claims of the '910 Patent.

27 586. Since learning of the '910 Patent and its infringing activities, DIRECTV
28 has failed to cease its infringing activities.

1 587. DIRECTV's customers and subscribers directly infringe at least claim 3
2 of the '910 Patent by using the Accused MoCA Instrumentalities in connection with
3 the Accused Services provided by DIRECTV.

4 588. DIRECTV actively induces its customers' and subscribers' direct
5 infringement by providing the Accused Services through the Accused MoCA
6 Instrumentalities, and associated support.

7 589. For example, DIRECTV actively induces infringement of at least claim
8 3 of the '910 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
9 customers with specific instructions and/or assistance (including installation and
10 maintenance) regarding the instantiation of a MoCA network and the use of the
11 Accused MoCA Instrumentalities to infringe the '910 Patent.

12 590. DIRECTV aids, instructs, supports, and otherwise acts with the intent
13 to cause an end user to make and/or use the MoCA network and/or use the Accused
14 MoCA Instrumentalities to infringe every element of at least claim 3 of the '910
15 Patent.

16 591. Additionally, DIRECTV contributes to the customers' and subscribers'
17 direct infringement. DIRECTV provides, *inter alia*, the Accused MoCA
18 Instrumentalities designed and configured to create a MoCA network and operate as
19 nodes in the network, the use of which infringes at least claim 3 of the '910 Patent.

20 592. The Accused MoCA Instrumentalities have no substantial noninfringing
21 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
22 the Accused Services provided by DIRECTV, the end user directly infringes at least
23 claim 3 of the '910 Patent. The Accused MoCA Instrumentalities are therefore
24 especially made or especially adapted for use in an infringing manner.

25 593. DIRECTV's inducement of, and contribution to, the direct infringement
26 of at least claim 3 of the '910 Patent has been, and is, continuous and ongoing through
27 the acts described above in connection with DIRECTV's provision of the Accused
28 Services.

1 601. The '0,566 Patent is directed to patent-eligible subject matter pursuant
2 to 35 U.S.C. § 101.

3 602. The '0,566 Patent is valid and enforceable, and presumed as such,
4 pursuant to 35 U.S.C. § 282.

5 603. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
6 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
7 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
8 DIRECTV HS17) in connection with operating and providing the Accused Services.

9 604. The Accused MoCA Instrumentalities deployed by DIRECTV to
10 customer premises remain the property of DIRECTV while deployed.

11 605. The Accused MoCA Instrumentalities operate while deployed in a
12 manner controlled and intended by DIRECTV.

13 606. As set forth in the attached non-limiting claim chart (Exhibit V), any
14 product or system operating in a MoCA network compliant with the charted
15 provisions of MoCA 2.0 necessarily infringes at least claim 1 of the '0,566 Patent.

16 607. Each aspect of the functioning of the Accused MoCA Instrumentalities
17 described in the claim chart operates while deployed to customer premises in a
18 manner controlled and intended by DIRECTV.

19 608. DIRECTV provides no software, support or other facility to customers
20 to modify any aspect of the functioning described in the claim chart of the Accused
21 MoCA Instrumentalities while deployed to customer premises.

22 609. The Accused MoCA Instrumentalities are compliant with MoCA 2.0, as
23 described in the '0,566 Patent claim chart, Exhibit V.

24 610. DIRECTV therefore directly infringes at least claim 1 of the '0,566
25 Patent by using the Accused MoCA Instrumentalities to provide Accused Services to
26 customers.

27 611. DIRECTV sells the Accused Services to its customers and subscribers
28 for a fee. Pursuant to the sale of these services, DIRECTV uses the method recited in

1 at least claim 1 of the '0,566 Patent to provide the Accused Services to DIRECTV's
2 customers and subscribers through the Accused MoCA Instrumentalities. DIRECTV
3 is therefore engaging in the infringing use of at least claim 1 of the '0,566 Patent in
4 order to generate revenue from its customers and subscribers.

5 612. DIRECTV directly infringes at least claim 1 of the '0,566 Patent when
6 it, for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
7 otherwise provide Accused Services.

8 613. DIRECTV had knowledge of the '0,566 Patent no later than its receipt
9 of Entropic's communications sent to DIRECTV on March 9, 2022.

10 614. DIRECTV has been aware that it infringes the '0,566 Patent no later
11 than its receipt of Entropic's communication sent to DIRECTV on March 9, 2022.

12 615. DIRECTV has known of or has been willfully blind to the '0,566 Patent
13 since before the March 9, 2022 communications from Entropic.

14 616. The '0,566 Patent issued while or before DIRECTV was a member of
15 MoCA.

16 617. Because of DIRECTV's knowledge of Entropic Inc.'s work and
17 contributions related to MoCA technology, DIRECTV had knowledge of the '0,566
18 Patent before March 9, 2022 or was willfully blind to its existence.

19 618. DIRECTV has been aware of its infringement of the '0,566 Patent no
20 later than February 17, 2023 when Entropic sent DIRECTV claim charts detailing
21 the infringement of the '0,566 Patent by MoCA technology, which is deployed by
22 DIRECTV. The claim charts DIRECTV received approximately three months before
23 the filing of this Complaint show that the claims of the '0,566 Patent are essential to
24 practicing at least MoCA standards versions 1.1, and/or 2.0.

25 619. The claims of the '0,566 Patent are essential to practicing at least MoCA
26 standards versions 1.1, and/or 2.0.

27 620. DIRECTV knew, or was willfully blind to the fact that the technology
28 of the '0,566 Patent directly relates to networking over coaxial cable, including

1 MoCA, at least as early as DIRECTV became aware of the existence of the '0,566
2 Patent. Because of its familiarity with, and access to, the MoCA standards,
3 DIRECTV knew, or was willfully blind to the fact, that use (by DIRECTV or its
4 customers) of instrumentalities compliant with MoCA 1.1, and/or 2.0 to deliver
5 DIRECTV services would necessarily infringe one or more claims of the '0,566
6 Patent.

7 621. Since learning of the '0,566 Patent and its infringing activities,
8 DIRECTV has failed to cease its infringing activities.

9 622. DIRECTV's customers and subscribers directly infringe at least claim 1
10 of the '0,566 Patent by using the Accused MoCA Instrumentalities in connection
11 with the Accused Services provided by DIRECTV.

12 623. DIRECTV actively induces its customers' and subscribers' direct
13 infringement by providing the Accused Services and associated support.

14 624. For example, DIRECTV actively induces infringement of at least claim
15 1 of the '0,566 Patent by providing the Accused MoCA Instrumentalities to
16 DIRECTV customers with specific instructions and/or assistance (including
17 installation and maintenance) regarding the instantiation of a MoCA network and the
18 use of the Accused MoCA Instrumentalities to infringe the '0,566 Patent.

19 625. DIRECTV aids, instructs, supports, and otherwise acts with the intent
20 to cause an end user to make and/or use the MoCA network and/or use the Accused
21 MoCA Instrumentalities to infringe every element of at least claim 1 of the '0,566
22 Patent.

23 626. Additionally, DIRECTV contributes to the customers' and subscribers'
24 direct infringement. DIRECTV provides at least the Accused MoCA
25 Instrumentalities that create and are at least substantially all of a MoCA network to
26 be used to infringe at least claim 1 of the '0,566 Patent.

27 627. The Accused MoCA Instrumentalities have no substantial noninfringing
28 uses. When an end user uses the Accused MoCA Instrumentalities in connection with

1 the Accused Services provided by DIRECTV, the end user directly infringes at least
2 claim 1 of the '0,566 Patent. The Accused MoCA Instrumentalities are therefore
3 especially made or especially adapted for use in an infringing manner.

4 628. DIRECTV's inducement of, and contribution to, the direct infringement
5 of at least claim 1 of the '0,566 Patent has been, and is, continuous and ongoing
6 through the acts described above in connection with DIRECTV's provision of the
7 Accused Services.

8 629. DIRECTV's infringement of the '0,566 Patent is, has been, and
9 continues to be willful, intentional, deliberate, and/or in conscious disregard for
10 Entropic's rights under the patent.

11 630. Entropic has been damaged as a result of the infringing conduct alleged
12 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
13 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
14 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

15 631. Upon information and belief, there is no duty to mark any
16 instrumentality with the '0,566 Patent in accordance with 35 U.S.C. § 287(a).

17 **COUNT XII**

18 **(Infringement of the '681 Patent)**

19 632. Entropic incorporates by reference each allegation of Paragraphs 1
20 through 459.

21 633. The '681 Patent duly issued on January 29, 2013 from an application
22 filed October 15, 2009 and, *inter alia*, a provisional application filed October 16,
23 2008.

24 634. Entropic owns all substantial rights, interest, and title in and to the '681
25 Patent, including the sole and exclusive right to prosecute this action and enforce the
26 '681 Patent against infringers, and to collect damages for all relevant times.

27 635. The '681 Patent is generally directed to, *inter alia*, improving local
28 clock time synchronization between a plurality of nodes in a communication

1 network. '681 Patent, Abstract. The '681 Patent has 40 claims, of which claims 1,
2 11, 21, and 31 are independent. At least these claims of the '681 Patent are directed
3 to a variety of techniques for clock synchronization for nodes in the MoCA network.
4 A true and accurate copy of the '681 Patent is attached hereto as Exhibit W.

5 636. The '681 Patent is directed to patent-eligible subject matter pursuant to
6 35 U.S.C. § 101.

7 637. The '681 Patent is valid and enforceable, and presumed as such,
8 pursuant to 35 U.S.C. § 282.

9 638. DIRECTV deploys one or more of the Accused MoCA Instrumentalities
10 (e.g., DIRECTV C31, DIRECTV C41, DIRECTV C51, DIRECTV C61, DIRECTV
11 C61K, DIRECTV HR24, DIRECTV HR34, DIRECTV HR44, DIRECTV HR54, and
12 DIRECTV HS17) in connection with operating and providing the Accused Services.

13 639. The Accused MoCA Instrumentalities deployed by DIRECTV to
14 customer premises remain the property of DIRECTV while deployed.

15 640. The Accused MoCA Instrumentalities operate while deployed in a
16 manner controlled and intended by DIRECTV.

17 641. As set forth in the attached non-limiting claim chart (Exhibit X), any
18 product or system operating in a MoCA network compliant with the charted
19 provisions of MoCA 2.0 necessarily infringes at least claim 1 of the '681 Patent.

20 642. Each aspect of the functioning of the Accused MoCA Instrumentalities
21 described in the claim chart operates while deployed to customer premises in a
22 manner controlled and intended by DIRECTV.

23 643. DIRECTV provides no software, support or other facility to customers
24 to modify any aspect of the functioning described in the claim chart of the Accused
25 MoCA Instrumentalities while deployed to customer premises.

26 644. The Accused MoCA Instrumentalities are compliant with MoCA 2.0
27 described in the '681 Patent claim chart, Exhibit X.

28 ///

1 645. DIRECTV therefore directly infringes at least claim 1 of the '681 Patent
2 by using the Accused MoCA Instrumentalities to provide Accused Services to
3 customers.

4 646. DIRECTV sells the Accused Services to its customers and subscribers
5 for a fee. Pursuant to the sale of these services, DIRECTV uses the method recited in
6 at least claim 1 of the '681 Patent to provide the Accused Services to DIRECTV's
7 customers and subscribers through the Accused MoCA Instrumentalities. DIRECTV
8 is therefore engaging in the infringing use of at least claim 1 of the '681 Patent in
9 order to generate revenue from its customers and subscribers.

10 647. DIRECTV directly infringes at least claim 1 of the '681 Patent when it,
11 for example, uses the Accused MoCA Instrumentalities to test, demonstrate or
12 otherwise provide Accused Services.

13 648. DIRECTV had knowledge of the '681 Patent no later than its receipt of
14 Entropic's communications sent to DIRECTV on August 9, 2022.

15 649. DIRECTV has been aware that it infringes the '681 Patent no later than
16 its receipt of Entropic's communication sent to DIRECTV on August 9, 2022.

17 650. DIRECTV has known of or has been willfully blind to the '681 Patent
18 since before the August 9, 2022 communications from Entropic.

19 651. The '681 Patent issued while or before DIRECTV was a member of
20 MoCA.

21 652. Because of DIRECTV's knowledge of Entropic Inc.'s work and
22 contributions related to MoCA technology, DIRECTV had knowledge of the '681
23 Patent before August 9, 2022 or was willfully blind to its existence.

24 653. DIRECTV has been aware of its infringement of the '681 Patent no later
25 than February 17, 2023 when Entropic sent DIRECTV claim charts detailing the
26 infringement of the '681 Patent by MoCA technology, which is deployed by
27 DIRECTV. The claim charts DIRECTV received approximately three months before
28

1 the filing of this Complaint show that the claims of the '681 Patent are essential to
2 practicing at least MoCA standards versions 1.1, and/or 2.0.

3 654. The claims of the '681 Patent are essential to practicing at least MoCA
4 standards versions 1.1, and/or 2.0.

5 655. DIRECTV knew, or was willfully blind to the fact that the technology
6 of the '681 Patent directly relates to networking over coaxial cable, including MoCA,
7 at least as early as DIRECTV became aware of the existence of the '681 Patent.
8 Because of its familiarity with, and access to, the MoCA standards, DIRECTV knew,
9 or was willfully blind to the fact, that use (by DIRECTV or its customers) of
10 instrumentalities compliant with MoCA 1.1, and/or 2.0 to deliver DIRECTV services
11 would necessarily infringe one or more claims of the '681 Patent.

12 656. Since learning of the '681 Patent and its infringing activities, DIRECTV
13 has failed to cease its infringing activities.

14 657. DIRECTV's customers and subscribers directly infringe at least claim 1
15 of the '681 Patent by using the Accused MoCA Instrumentalities in connection with
16 the Accused Services provided by DIRECTV.

17 658. DIRECTV actively induces its customers' and subscribers' direct
18 infringement by providing the Accused Services and associated support.

19 659. For example, DIRECTV actively induces infringement of at least claim
20 1 of the '681 Patent by providing the Accused MoCA Instrumentalities to DIRECTV
21 customers with specific instructions and/or assistance (including installation and
22 maintenance) regarding the instantiation of a MoCA network and the use of the
23 Accused MoCA Instrumentalities to infringe the '681 Patent.

24 660. DIRECTV aids, instructs, supports, and otherwise acts with the intent
25 to cause an end user to make and/or use the MoCA network and/or use the Accused
26 MoCA Instrumentalities to infringe every element of at least claim 1 of the '681
27 Patent.

28 ///

1 661. Additionally, DIRECTV contributes to the customers' and subscribers'
2 direct infringement. DIRECTV provides at least the Accused MoCA
3 Instrumentalities that create and are at least substantially all of a MoCA network to
4 be used to infringe at least claim 1 of the '681 Patent.

5 662. The Accused MoCA Instrumentalities have no substantial noninfringing
6 uses. When an end user uses the Accused MoCA Instrumentalities in connection with
7 the Accused Services provided by DIRECTV, the end user directly infringes at least
8 claim 1 of the '681 Patent. The Accused MoCA Instrumentalities are therefore
9 especially made or especially adapted for use in an infringing manner.

10 663. DIRECTV's inducement of, and contribution to, the direct infringement
11 of at least claim 1 of the '681 Patent has been, and is, continuous and ongoing through
12 the acts described above in connection with DIRECTV's provision of the Accused
13 Services.

14 664. DIRECTV's infringement of the '681 Patent is, has been, and continues
15 to be willful, intentional, deliberate, and/or in conscious disregard for Entropic's
16 rights under the patent.

17 665. Entropic has been damaged as a result of the infringing conduct alleged
18 above. DIRECTV is liable to Entropic in an amount that compensates Entropic for
19 DIRECTV's infringement, which by law cannot be less than a reasonable royalty,
20 together with interest and costs as fixed by this Court under 35 U.S.C. § 284.

21 666. Upon information and belief, there is no duty to mark any
22 instrumentality with the '681 Patent in accordance with 35 U.S.C. § 287(a).

23 **JURY DEMAND**

24 Entropic hereby requests a trial by jury on all issues so triable by right.

25 **PRAYER FOR RELIEF**

26 WHEREFORE, Entropic requests that:

27 A. The Court find that DIRECTV has directly infringed the Patents-in-Suit
28 and hold DIRECTV liable for such infringement;

1 B. The Court award damages pursuant to 35 U.S.C. § 284 adequate to
2 compensate Entropic for DIRECTV's past and future infringement of the Patents-in-
3 Suit, including both pre- and post-judgment interest and costs as fixed by the Court;

4 C. The Court increase any award to Entropic by a judicially appropriate
5 amount;

6 D. The Court declare that this is an exceptional case entitling Entropic to
7 its reasonable attorneys' fees under 35 U.S.C. § 285; and

8 E. The Court award such other relief as the Court may deem just and
9 proper.

10
11
12
13 Dated: November 7, 2023

Respectfully submitted,

14 By: /s/ Douglas Jordan Winnard

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